400 Seventh Street, S.W.
Washington, D.C. 20590

U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

Dear Crash Data Researchers/Users:

Thank you for choosing crash data from the National Highway Traffic Safety Administration (NHTSA) for your research or other use. The information contained in this motor vehicle crash report is collected, maintained and distributed in accordance with Public Law 89-564. In accordance with this Public Law, NHTSA is required not to release any case information until completion of quality control procedures. These procedures include a review of the case material to extract all names, licenses and registration numbers, non-coded interview material, non-research related researcher comments in the margins, non-factual data, and the production number portion of the vehicle identification number (VIN).

If you requested NHTSA to query its database files in order to identify a specific crash, then that query was made using non-personal descriptors you provided for use in our search. This motor vehicle crash may have been identified from a data search and matches the general, non-personal descriptors you provided, but we cannot confirm that this is the specific crash report you requested.

If you have any questions with regard to the above procedures, please contact the Field Operations Branch, Crash Investigation Division, National Center for Statistics and Analysis at 202-366-4820. Again, please be advised that we cannot confirm that this is the case that you have specifically requested nor can we certify the information to be correct.

*** *** ***

TRANSPORTATION SCIENCES CENTER
ACCIDENT RESEARCH GROUP

Division of Arvin/Calspan
[redacted] New York [redacted]

# CALSPAN ON-SITE AIR BAG DEPLOYMENT INVESTIGATION

CALSPAN CASE NO. 91-14

FLEET - 1992 PLYMOUTH ACCLAIM

LOCATION - [redacted]

ACCIDENT DATE - [redacted] 1991

Contract No. DTNH22-87-C-27169

Prepared for:

U.S. Department of Transportation
National Highway Traffic Safety Administration
Washington, D.C. 20590

## DISCLAIMERS

This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government assumes no responsibility for the contents or use thereof.

The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the National Highway Traffic Safety Administration.

The crash investigation process is an inexact science which requires that physical evidence such as skid marks, vehicular damage measurements, and occupant contact points be coupled with the investigator's expert knowledge and experience of vehicle dynamics and occupant kinematics in order to determine the precrash, crash, and post-crash movements of involved vehicles and occupants.

Because each crash is a unique sequence of events, generalized conclusions cannot be made concerning the crashworthiness performance of the involved vehicle(s) or their safety systems.

## TECHNICAL REPORT STANDARD TITLE PAGE

| 1. Report No. | 2. Government Accession No. | 3. Recipient's Catalog No. |
|---|---|---|
| 91-14 | | |

| 4. Title and Subtitle | 5. Report Date |
|---|---|
| Calspan On-Site Air Bag Deployment Investigation<br>Vehicle - 1992 Plymouth Acclaim<br>Location - [redacted] | [redacted] 1992 |
| | 6. Performing Organization Code |
| 7. Author(s) | 8. Performing Organization Report No. |
| Accident Research Group | |
| 9. Performing Organization Name and Address | 10. Work Unit No. |
| Transportation Sciences Center<br>Accident Research Group<br>[redacted] Corporation<br>[redacted] NY [redacted] | [redacted] |
| | 11. Contract or Grant No. |
| | DTNH22-87-C-27169 |
| | 13. Type of Report and Period Covered |
| 12. Sponsoring Agency Name and Address | Technical Report<br>Accident Date [redacted]/91 |
| U.S. Department of Transportation<br>National Highway Traffic Safety Administration<br>Washington, D.C. 20590 | 14. Sponsoring Agency Code |

15. Supplementary Notes

On-site investigation of an air bag deployment crash that involved a 1992 Plymouth Acclaim.

16. Abstract

This on-site investigation focused on a severe head-on crash that involved a 1992 Plymouth Acclaim (air bag equipped) and a 1980 Mercury Zephyr station wagon. The vehicles were traveling in opposite directions on a rural 2 lane roadway in a 55 mph speed zone. The driver of the Mercury entered the Plymouth's lane of travel as she attempted a left turn at a 3-leg Y intersection.

The vehicles impacted in a head-on configuration which resulted in velocity changes of 38.9 mph for the Plymouth and 35.0 mph for the Mercury. As a result of the crash, the Plymouth's driver air bag system deployed.

The driver of the Plymouth was a 49 year old male, 75", 185 lbs. He was properly wearing the active 3-point lap and shoulder belt system. He initiated a forward trajectory in response to the 11 o'clock impact force and loaded the belt webbing and the deployed air bag. The driver compressed the bag against the steering wheel as his loading force was transmitted into the steering assembly. As a result, the wheel was deformed 3.5" forward and the energy absorbing steering column was compressed 2.5". His knees and lower legs impacted the lower instrument panel and knee bolster. As a result of his contacts, the driver sustained 4 fractured ribs (AIS-2), a fractured left patella (AIS-2), a ruptured tendon of the right knee (AIS-2), a fractured left wrist (AIS-2), 2 fractured right metacarpals (AIS-2), a facial contusion (AIS-1), and lower leg abrasions (AIS-1).

The Mercury Zephyr was occupied by the 59 year old female driver and 3 child occupants in the outboard positions. All occupants were wearing the available restraint systems. The driver and left rear occupant sustained fatal injuries. The right front and right rear occupants sustained moderate (AIS-2) level internal injuries.

| 17. Key Words | 18. Distribution Statement |
|---|---|
| Severe head-on impact sequence<br>ΔV's of 38.9 mph and 35.0 mph<br>Air bag deployment | General Public |

| 19. Security Classif. (of this report) | 20. Security Classif. (of this page) | 21. No. of Pages | 22. Price |
|---|---|---|---|
| Unclassified | Unclassified | 103 | |

Form DOT F 1700.7 (8-69)

TABLE OF CONTENTS

CALSPAN ON-SITE AIR BAG DEPLOYMENT INVESTIGATION

CALSPAN CASE NO. 91-14

FLEET - 1992 PLYMOUTH ACCLAIM
LOCATION [redacted]

## SUMMARY

This crash occurred at a rural 3-leg Y intersection on [redacted] 1991, during daylight hours. The asphalt road surface was dry and level with a posted speed limit of 55 mph. The involved vehicles were a 1992 Plymouth Acclaim, that was equipped with a supplemental driver's air bag system, and a 1980 Mercury Zephyr station wagon. The Mercury Zephyr was traveling in a northerly direction on the two lane roadway at a witness estimated speed of 40-45 mph. The station wagon was in the middle of a group of northbound vehicles that approached the impending crash scene on a slight left curve. The Mercury Zephyr was occupied by a 59 year old female driver and three child passengers who were seated in the outboard positions.

The air bag equipped 1992 Plymouth Acclaim was traveling in a southerly direction on the two lane roadway at a computed speed of 58.4 mph. The 49 year old male driver was enroute to work and stated that he was the only southbound vehicle in the immediate area of the crash scene. As he approached the intersection, the driver of the Plymouth noted the Mercury Zephyr emerge from the line of northbound traffic into his lane of travel. The driver of the Mercury was attempting a left turn onto the intersecting roadway; however, based on the location of the impending impact, she was attempting to turn into the left (eastbound) lane of the intersecting road. The road intersected at a shallow angle of 27° for northbound traffic which allowed for a high speed left turn.

The driver of the Plymouth steered slightly in a clockwise direction and braked with full force to lock the front wheels of his vehicle. The Plymouth subsequently skidded a police reported distance of 62.2' in a tracking orientation to impact. (During our on-site investigation, which was conducted on [redacted] 12 and 13, 51.3' of skid marks were still visible on the road surface.)

The full frontal area of the Plymouth Acclaim impacted the frontal area of the Mercury Zephyr station wagon in the southbound lane at the mouth of the intersecting roadway. Impact speeds were computed by the damage and trajectory algorithm of the CRASHPC program at 44.9 mph for the Plymouth Acclaim and 32.1 mph for the Mercury Zephyr. Resultant directions of force were within the 11 o'clock sector for the Plymouth and 1 o'clock for vehicle #2. As a result of the head-on crash, the Plymouth Acclaim underwent a velocity change of 38.9 mph while vehicle #2 sustained a velocity change of 35.0 mph. The impact induced deceleration deployed the Plymouth's driver air bag system.

The Plymouth Acclaim sustained 32.0" of front bumper crush located 2.25" left of center. Crush values at bumper level were as follows: $C_1$=24.5", $C_2$=29.5", $C_3$=31.0", $C_4$=28.0", $C_5$=23.625", $C_6$=16.9". The impact reduced the wheelbases by 4.9" on the left and 7.3" on the right side. Vehicle #2 sustained 33.6" of

frontal crush located at the right bumper corner. Crush values at bumper level were as follows: $C_1$=11.6", $C_2$=19.2", $C_3$=26.1", $C_4$=24.0", $C_5$=27.4", $C_6$=33.625". The Mercury's wheelbases were reduced by 6.9" on the left side and 10.25" on the right side.

The Plymouth Acclaim was displaced laterally to its right as it came to rest near the point of impact. The Mercury Zephyr was rotated approximately 37° in a counterclockwise direction and displaced 8' south (rearward) of the point of impact. At rest, the Mercury was nearly perpendicular to the roadway.

The driver of the Plymouth Acclaim was a 49 year old male who was 75" tall, with a weight of 185 lbs. He was in a normal seated position with the driver's seat adjusted to the full rearward position. The driver was properly wearing the active 3-point lap and shoulder belt system. Belt usage was supported by loading evidence found on webbing and system hardware. The driver attempted to brace against the steering wheel with both hands as he initiated a forward trajectory in response to the severe head-on crash. He loaded the active belt webbing with sufficient force to produce a 3" diagonally orientated black plastic transfer on the shoulder belt webbing from the B-pillar mounted D-ring. The lap belt webbing abraded the plastic extrusion at the outboard side of the seat cushion/seat back juncture. The driver subsequently loaded the deployed air bag and compressed the bag against the steering wheel. His loading force was transmitted into the steering assembly which deformed the wheel rim 3.5" and compressed the energy absorbing column 2.5" (shear capsule separation). As a result of his engagement with the active belt webbing and the steering assembly, the driver sustained 4 fractured ribs (AIS-2), 3 on the left side and 1 on the right. His face contacted the upper surface of the deployed air bag which displaced his sunglasses against his face. As a result, the driver sustained a contusion around his left eye (AIS-1).

The driver's hands separated from the wheel rim and subsequently impacted the upper instrument panel. His left hand scuffed the upper panel 16.5-18.5" left of center and compressed the energy absorbing material. The contact resulted in a fracture of his left wrist (AIS-2). Although the right hand contact did not produce contact evidence, he sustained fractures of the right 4th and 5th metacarpals (AIS-2). The driver's left knee impacted the left mid instrument panel 20-23" left of center. The contact fractured his left patella (AIS-2) and cracked the plastic panel. His left lower leg contacted the knee bolster which produced blue fabric transfers to the component and abrasions (AIS-1) to the anterior aspect of his left leg. The driver's right knee impacted the right side of the knee bolster at the steering column position and at the right side of the bolster. Blue fabric transfers evidenced the contact area which resulted in a ruptured tendon (AIS-2) of his right knee.

Following the impact sequence, the driver of the Plymouth came to rest in an upright attitude behind the steering assembly. He unfastened the active restraint system and attempted to exit the left front door. Due to the severe frontal crush and induced deformation throughout the vehicle's structure, he was unable to open any of the four doors. A passing motorist was able to open the left rear door to allow the driver to exit the vehicle. He was subsequently transported by ambulance to a local hospital where he was admitted for 5 days for treatment of his injuries.

The driver of the 1980 Mercury Zephyr station wagon was wearing the active 3-point lap and shoulder belt; however, the shoulder belt was loosely adjusted across her torso (normal driving habit, per husband). At impact, she initiated a forward trajectory and loaded the active belt webbing which abraded the upper seatback and plastic extrusion at the seatback/seat cushion juncture. Her face impacted the steering wheel rim at the right upper spoke area. Tooth fragments were found embedded in the after-market steering wheel cover. The driver's knees contacted and fractured the lower instrument panel on each side of the steering column. The energy from the right knee loading was transmitted through the femur and into the right hip area. The investigating officer stated that she sustained an open fracture of the right hip area. The driver also sustained severe head and thoracic injuries and expired at the scene.

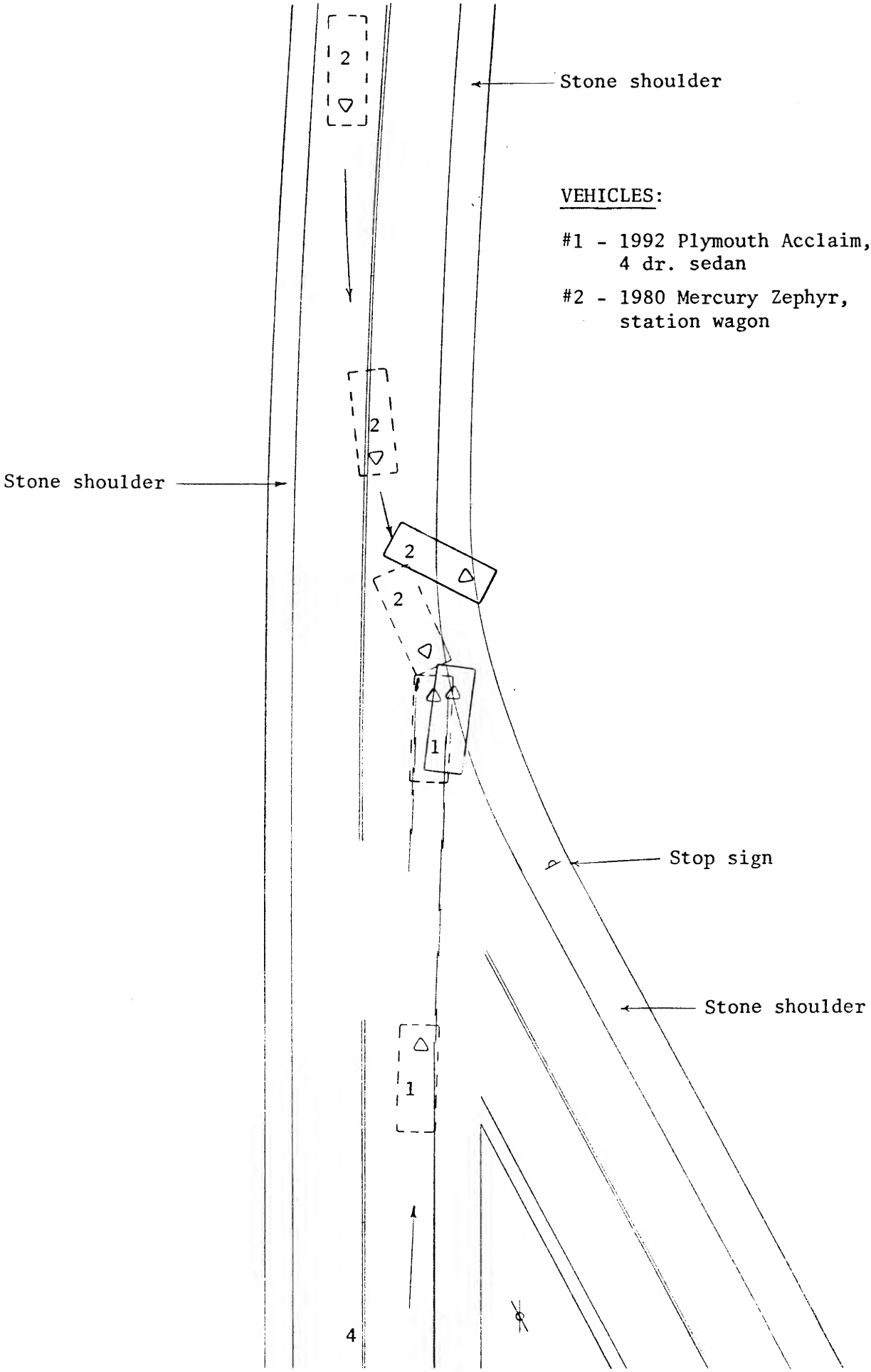
The right front occupant of the Mercury Zephyr was a 9 year old female who was fully restrained by the active 3-point lap and shoulder belt system. She initiated a forward trajectory in response to the frontal impact sequence and loaded the active belt system. which resulted in a ruptured spleen (AIS-2) and fractured ribs (AIS-2). Her right knee contacted the intruding glove box area of the vehicle. The contact fractured the plastic component and deformed the metal brackets to a depth of 1"; however, no injury occurred from the contact.

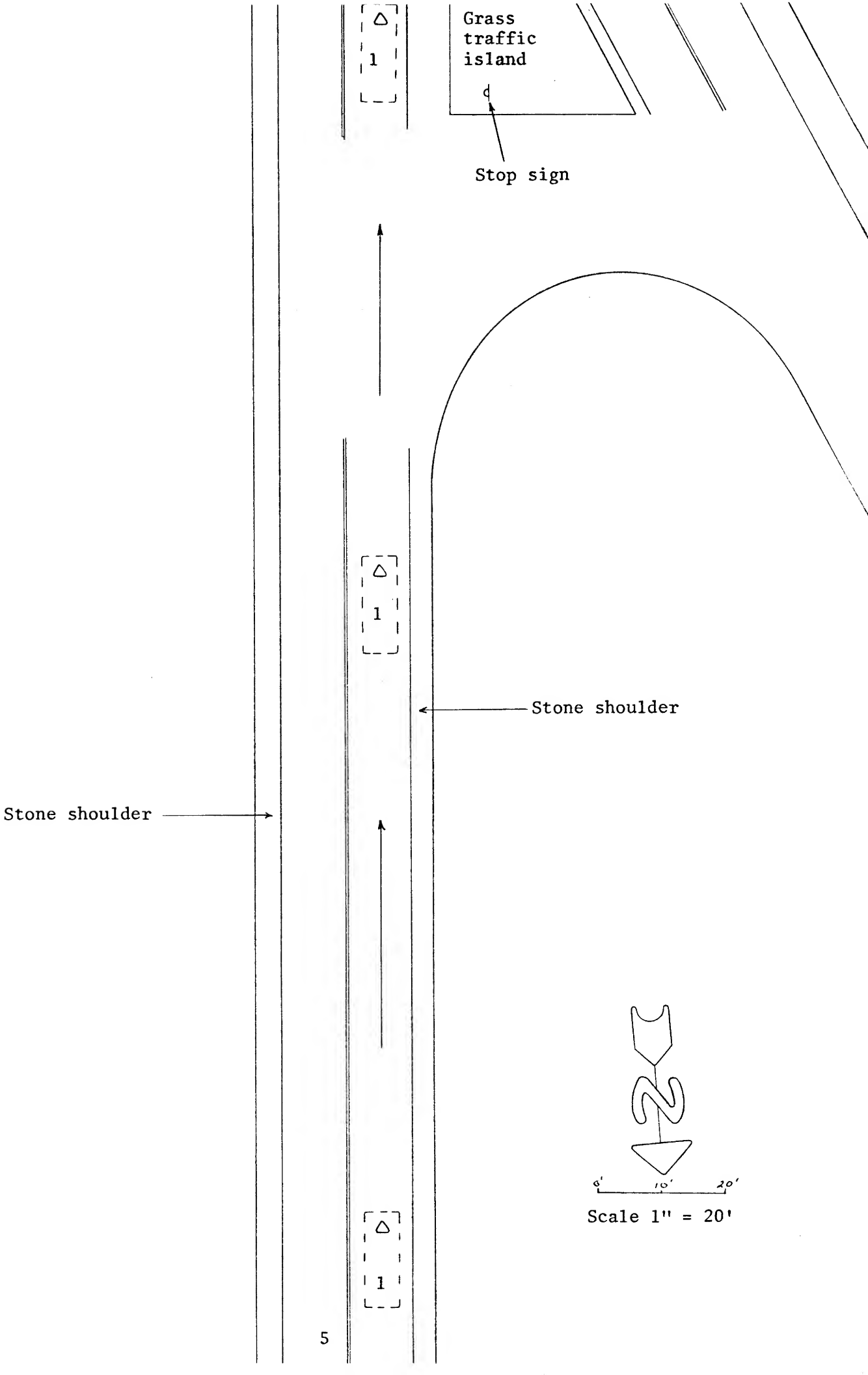
The left rear occupant was a 6 year old female who was reported as large for her age. She was wearing the 2-point lap belt and was holding a cardboard box which contained a pet rabbit. It was unknown if she was in a normal seated position or was in a forward position attending to the rabbit. She was thrust forward with respect to the decelerating vehicle at impact and loaded the lap belt which pitched her body forward at the waist. Her head possibly struck the right side of the upper seatback. The vinyl fabric was disrupted at this area and there appeared to be faint tissue transfers on the seam area. The occupant sustained a complete transection of the cervical spine (AIS-6) which resulted from either seatback contact (head hyperflexion) or hyperextension of the head from lap belt loading. She was transported to a local hospital where she expired on arrival.

The right rear occupant of the Mercury was a 4 year old female who was restrained by the lap belt (no child seat). She loaded the lap belt and sustained kidney contusions with hematuria (AIS-2). The occupant was transported to a local hospital where she was admitted for treatment of her injuries.

ACCIDENT SCHEMATIC

CALSPAN CASE NO. 91-14




Grass
traffic
island
Stop sign
1
1
1
Stone shoulder
Stone shoulder
0'
10'
20'
Scale 1" = 20'

CALSPAN ON-SITE AIR BAG DEPLOYMENT INVESTIGATION

CALSPAN CASE NO. 91-14

FLEET - 1992 PLYMOUTH ACCLAIM
LOCATION - [redacted], VIRGINIA

ACCIDENT DATA

| | |
|---|---|
| Location: | Rural 3-leg Y intersection |
| City/Township: | [redacted] |
| Area/Type: | Rural/Residential |
| Accident Date/Time: | [redacted], 1991, daylight hours |
| Investigating Police Agency: | [redacted] Sheriff's Department |
| Accident Type: | Car/Car, head-on configuration |
| Air Bag Vehicle Driver Injury Severity: | Moderate (AIS-2) |

AMBIENCE

| | |
|---|---|
| Viewing Conditions: | Daylight |
| Weather: | Clear |
| Precipitation: | None |
| Road Surface: | Dry |
| Temperature: | 27° F |

HIGHWAY

| | Air Bag Vehicle | Vehicle #2 |
|---|---|---|
| Type: | Secondary state route | Secondary state route |
| Number of Lanes: | 2 | 2 |
| Width: | 20'4" | 20'4" |
| Surface: | Asphalt | Asphalt |
| Median: | None | None |

HIGHWAY (CONT'D.)

| | Air Bag Vehicle | Vehicle #2 |
|---|---|---|
| Edge: East edge - | 4'2" stone shoulder | 4'2" stone shoulder |
| West edge - | 3'9" stone shoulder | 3'9" stone shoulder |
| Vertical Alignment: | Level | Level |
| Horizontal Alignment: | Straight | Slight left curve |
| Estimated Coefficient of Friction: | .75 | .75 |
| Traffic Density: | Light (northbound direction) | Moderate (southbound direction) |

TRAFFIC CONTROLS

| | |
|---|---|
| Signals: | None |
| Signs: | No pertinent signs |
| Markings: | Solid white edge lines, yellow full barrier center lines |
| Speed Limit: | 55 mph |

VEHICLES

| | Air Bag Vehicle | Vehicle #2 |
|---|---|---|
| Description: | 1992 Plymouth Acclaim LE, 4 dr. sedan | 1980 Mercury Zephyr, 4 dr. station wagon |
| V.I.N.: | 1P3XA46K2NF (production number deleted) | OK36B (production number deleted) |
| Color: | Black | Gray |
| Odometer: | 685 miles | 83,372.2 miles |
| Engine: | 4 cylinder, 2.5 liter | 6 cylinder |
| Transmission: | 3-speed automatic, column mounted transmission selector lever | 3-speed automatic, column mounted transmission selector lever |
| Steering: | Power assisted rack-and-pinion | Power rack-and-pinion |
| Brakes: | Power assisted front disc, rear drum brakes | Power front disc, rear drum brakes |

VEHICLES (CONT'D.)

| | Air Bag Vehicle | Vehicle #2 |
|---|---|---|
| Padding: | Upper and mid instrument panel, soft edged steering wheel rim and air bag module cover, sunvisors, fold-down center armrest, adjustable head restraints, door panels, door armrests | Upper instrument panel, sunvisors, fold-down center armrests, adjustable head restraints, door panels, door armrests |
| Active Restraints: | 3-point lap and shoulder belts in the four outboard seated positions, center front and center rear lap belts | 3-point lap and shoulder belts in the front outboard seated positions, center front lap belt, 3 rear seat lap belts |
| Automatic Restraints: | Driver's side air bag system which deployed at impact with vehicle #2 | None |
| Defects: | None | None |
| Tow Status: | Towed due to damage | Towed due to damage |

VEHICLE DAMAGE

| | Air Bag Vehicle | Vehicle #2 |
|---|---|---|
| Exterior: | The 1992 Plymouth Acclaim sustained severe frontal damage from its head-on impact sequence with vehicle #2. Maximum frontal crush was 32.0" located on the bumper face, 2.25" left of center. The lateral extent of direct contact damage was 50.5" which spanned the entire frontal plane of the vehicle. Crush values at bumper level were as follows: $C_1$=24.5", $C_2$=29.5", $C_3$=31.0", $C_4$=28.0", $C_5$=23.625", $C_6$=16.875".<br><br>The impact buckled the hood at the designated fold points and displaced the hood slightly rearward. The hood latch separated and both hinge assemblies were deformed; however, the hinges remained intact. At maximum engagement, the left rear corner of the hood contacted and penetrated the lower left corner of the windshield. A 2.25" horizontal tear of the plastic laminate was noted to the contacted area. | The 1980 Mercury Zephyr station wagon sustained severe frontal crush from the 1 o'clock direction of force impact. The frontal structure of the vehicle was displaced both rearward and laterally to the vehicle's left. Maximum frontal crush was 33.625" located at the right corner of the bumper. Direct contact damage began 10" left of the vehicle's centerline and extended 42.75" to the right bumper corner. The combined induced and direct contact damage length was 60.75" which involved the full frontal width of the vehicle (bumper corner to bumper corner). Crush values at bumper level were as follows: $C_1$=11.625", $C_2$=19.2", $C_3$=26.125", $C_4$=24.0", $C_5$=27.4", $C_6$=33.625". |

VEHICLE DAMAGE (CONT'D.)

| | Air Bag Vehicle | Vehicle #2 |
|---|---|---|
| Exterior (Cont'd.): | The frontal damage compressed the unibody structure of the vehicle. The wheelbases were reduced by 4.875" on the left side and 7.3" on the right side. Remote buckling occurred to both sills with vertical displacement of the floor pan. Both right side doors remained closed during the impact sequence and were jammed as a result of vehicle deformation. The left side doors were initially difficult to open post-crash (per driver). However, at the time of our inspection, the left doors were fully operational. The left front door was distorted due to deformation of the left A-pillar.<br><br>The windshield bond remained intact along all four sides of the glass. The glass was cracked from both hood contact and stress as the cowl area of the vehicle was displaced rearward. All door side glass and backlight glass were not damaged. | Lateral displacement of the front bumper was 11.25" at the left corner.<br><br>Compression of the frontal area buckled the unibody structure upward at the base of the B-pillars. The left front door was jammed closed between the A- and B-pillars and was subsequently removed by rescue personnel with hydraulic equipment. The right front door was jammed closed; however, rescue personnel were able to force the door open. Both rear doors remained closed and operational post-crash.<br><br>The wheelbases were reduced in length by 6.875" on the left side and 10.25" on the right. |
| CDC: | 11-FDEW-3 | *81-FDEW-4 |
| Repair Cost: | Total loss | Total loss |
| Interior: | The interior of the Plymouth Acclaim sustained moderate damage from exterior deformation and driver contact. Passenger compartment intrusion was minimal for the severity of the crash. Maximum intrusion involved 5.25" of rearward displacement of the left toe pan. The right toe pan was intruded 2.5" rearward. Compression of the frontal structure displaced the instrument panel approximately 1.5" rearward. | Vehicle #2's interior was damaged as a result of exterior deformation which produced intrusion of the instrument panel, floor, and toe pans. The occupants also contacted numerous components which resulted in additional damage. The driver's left knee contacted the fuse box cover area of the lower instrument panel. The contact fractured the |

*Vehicle #2's 1 o'clock direction of force was incremented by a value of 80 to reflect the lateral displacement (shifting) of the frontal structure.

VEHICLE DAMAGE (CONT'D.)

| | Air Bag Vehicle | Vehicle #2 |
|---|---|---|
| Interior (Cont'd.): | The floor pan subsequently buckled upward to a maximum depth of 4" located under the left front seat. As a result of the floor pan deformation and the energy of the impact, the driver's seat was displaced vertically and rotated slightly in a counterclockwise direction.<br><br>The driver of the Plymouth Acclaim had properly used the active 3-point lap and shoulder belt system. At impact, he initiated a forward trajectory with respect to the vehicle and loaded the active belt webbing. His loading force against the shoulder belt pulled the webbing through the B-pillar mounted D-ring which produced a diagonal black plastic transfer on the webbing. The D-ring transfer was located 59-62" from the floor anchor point of the belt webbing. The driver's loading of the lap belt portion of the 3-point system produced abrasions to the plastic cover which housed the seat back recline mechanism. The horizontally orientated abrasions measured 4.75" in length and were located on the radius of the plastic cover. Abrasions were also observed to the plastic slide on the cinch bar of the system's latchplate. There was no evidence of belt stretching or damage to the webbing. On the outside surface (side away from driver) of the belt webbing, white fabric transfers were noted 42-44" above the floor anchor reference point. The white fabric transfers were probably a result of belt contact with the deployed driver's side air bag.<br><br>The driver's left knee impacted the left mid instrument panel adjacent to the rear defroster switch. The contact, which was located 20-23" left of center | cover and the adjacent plastic panel 18-23" left of center and 10-14" below the upper instrument panel. Her right knee penetrated the lower plastic panel and engaged with the support brackets. The area of deformation was located 12-14" left of center and 12-15" below the horizontal reference axis.<br><br>Although restrained, her face and thoracic areas contacted the steering assembly. Tooth fragments were found embedded into the aftermarket steering wheel cover, above the right upper spoke. (At the time of our inspection, the wheel was rotated approximately 120° in a counterclockwise direction.) Her thoracic loading force against the steering wheel deformed the rim and spokes .75" forward. The extruder type steering column was also compressed 1.5".<br><br>The driver was belted; however, she was wearing the belt loose (normal driving habit, per husband). She loaded the shoulder belt webbing which abraded the upper side surface of the left front seat back. The triangular abrasion measured 2.5" horizontally x 2.5" vertically. A vinyl transfer was visible on the inside surface of the shoulder belt webbing 59-65.5" above the floor.<br><br>The lap belt abraded the plastic cover at the seat cushion/seat back juncture. Abrasions were also noted to the belt webbing 6.5-12" above the floor anchor point |

VEHICLE DAMAGE (CONT'D.)

| | Air Bag Vehicle | Vehicle #2 |
|---|---|---|
| Interior (Cont'd.): | and 8-10.25" below the upper panel, cracked the plastic panel and deposited blue fabric transfers to the struck component. Continuing down from the knee contact were additional blue fabric transfers that extended onto the knee bolster and fuse box cover. These transfers resulted from his lower left leg as it was thrust forward by the impact force. The lower leg transfers were 20.5-22.5" left of center and 11.75-18" below the upper instrument panel. The driver's right knee initially contacted the knee bolster protrusion for the steering column. A large blue fabric transfer was documented 8-10" left of center and 12-14.25" below the upper instrument panel. His knee was deflected to the right where it subsequently contacted and scuffed the upper right corner of the knee bolster (5.75-8" left and 11-15" down) and continued laterally into the side surface of the center instrument panel adjacent to the radio. The contact cracked the plastic panel and deposited blue fabric transfers 5" left of center and 10.5-15" below the upper panel. The driver's lower right leg scuffed and fractured the lower edge of the knee bolster 6.5-9" left and 17.5-20" down from the reference axis.<br><br>The driver attempted to brace against the steering wheel rim with both hands at impact. His left hand separated from the upper rim and subsequently impacted the upper instrument panel 16.5-18.5" left of center. The contact compressed the energy absorbing material and displaced the panel upward. His right hand probably struck the left side of the rear view mirror. Vertical scuffs were noted to the glass of the mirror and the assembly was rotated downward approximately 15°. | that resulted from the plastic cover contact. Blood stains covered the majority of the exposed belt webbing.<br><br>The child right front occupant was properly restrained by the active 3-point lap and shoulder belt system. Her loading force against the belt webbing produced a similar abrasion to the right seat back surface. The belt webbing abrasion measured 1" vertically x 1.75" horizontally on the seat back. Vinyl transfers were noted to the webbing 45-47.5" above the floor anchor point of the continuous loop belt. Her right knee impacted the intruding glove box area which fractured the plastic door and deformed the underlying metal support bracket to a depth of 1". The contact was located 24-28" right of center and 14-17" below the upper panel.<br><br>Both rear seat occupants of vehicle #2 were wearing the available lap belts. Their loading force against the belt webbing fractured the outboard plastic retainer assemblies at the retractor side of the respective systems. There was no evidence of loading (i.e., belt stretching, etc.) on the belt webbing. Although the front seat assembly was displaced forward by the crash forces, an area of possible left rear passenger head contact was noted to the left seat back. Minute white transfers (possible tissue) and blood were noted to a compressed area at the upper right quadrant of the seat back. |

VEHICLE DAMAGE (CONT'D.)

| | Air Bag Vehicle | Vehicle #2 |
|---|---|---|
| Interior (Cont'd.) | The driver's thoracic area loaded the deployed air bag and compressed the bag against the steering assembly. His loading force was transmitted through the bag which deformed the upper steering wheel rim 3.5" forward and compressed the energy absorbing steering column. Shear capsule separation was measured at 2.3" on the left bracket and 2.5" on the right side. There was no evidence of driver contact (i.e., tissue/fabric transfers) to the deployed air bag. | |

VEHICLE VELOCITY ESTIMATES

| | Air Bag Vehicle | Vehicle #2 |
|---|---|---|
| Travel Speed: | 58.4 mph | 40-45 mph (witness estimates) |
| Impact Speed: | 44.9 mph | 32.1 mph |
| Total $\Delta V$: | 38.9 mph | 35.0 mph |
| Longitudinal $\Delta V$: | -38.3 mph | -33.1 mph |
| Lateral $\Delta V$: | 6.7 mph | -11.2 mph |
| Energy Absorption: | 136544.7 ft.lbs. | 148522.7 ft.lbs. |

The above velocity estimates were computed by the damage and trajectory algorithm of the CRASHPC program. The air bag vehicle's initial travel speed was computed using the police reported skid distances. At the time of our on-site investigation, approximately 10 ft. of skid marks had lifted from the asphalt road surface.

COLLISION SEQUENCE

Pre-Crash: The driver of the 1992 Plymouth Acclaim was en route to work and was traveling in a southerly direction on the rural two lane state route at a driver estimated speed of 55-60 mph. (A travel speed of 58.4 mph was computed using the CRASHPC results and the police reported skid distances.) The driver stated that his was the only southbound vehicle in the vicinity as he approached the 3-leg Y intersection. He did note a line of approximately twelve northbound vehicles approaching the intersection.

COLLISION SEQUENCE (CONT'D.)

Pre-Crash (Cont'd.): Vehicle #2 was traveling within the group of northbound traffic at a witness estimated speed of 40-45 mph. As driver #2 approached the intersection, she initiated a clockwise steering input and entered the southbound travel lane prior to initiating a left turn onto the intersecting roadway. The Y-configuration intersection allowed for a high speed left turn within the 35-40 mph range.

The driver of the air bag equipped Plymouth Acclaim noted vehicle #2 as it entered his lane of travel; however, he stated that he did not detect the vehicle's left turn signal. He braked with sufficient force to lock the front wheels of his vehicle and possibly steered in a clockwise direction in an attempt to avoid impact. The Plymouth skidded in a tracking orientation a police documented distance of 62.2' to impact. (At the time of our on-site investigation, 51.3' of skid marks remained visible on the asphalt road surface.)

Based on the CRASHPC generated impact speeds, the driver of vehicle #2 probably braked prior to impact. There were no visible skid marks on the road surface from vehicle #2.

Crash: The Plymouth Acclaim and Mercury Zephyr impacted in a head-on configuration on the extreme right side of the southbound travel lane at the mouth of the intersection. Impact speeds were computed at 44.9 mph for the Plymouth and 32.1 mph for vehicle #2 by the damage and trajectory algorithm of the CRASHPC program. Resultant directions of force were within the 11 o'clock sector for the Plymouth and 1 o'clock for vehicle #2. Velocity changes were computed by the CRASHPC program at 38.9 mph for the Plymouth and 35.0 mph for the Mercury. As a result of the impact induced deceleration, the Plymouth's driver air bag system deployed. The driver stated that he noted a gray flash at impact which he later identified as the deployed air bag.

As the vehicles crushed to maximum engagement, the Plymouth was displaced laterally to its right before coming to rest near the point of impact. The momentum of the Plymouth Acclaim displaced vehicle #2 approximately 8 ft. rearward of its at impact position. The lateral component of vehicle #2's 1 o'clock impact force rotated the vehicle approximately 37° in a counterclockwise direction. The Mercury Zephyr came to rest with its center of gravity straddling the west edgeline of the southbound travel lane.

Post-Crash:

Final Rest - The Plymouth Acclaim came to rest on the apron of the intersection with its right front tire resting approximately 6" outboard of the white edgeline. At rest, the vehicle was facing in a southerly direction.

Vehicle #2 came to rest straddling the white edgeline of the southbound travel lane. The vehicle was blocking the southbound travel lane and was facing in a northwesterly direction.

COLLISION SEQUENCE (CONT'D.)

Post-Crash (Cont'd.)

Driver Activities - The driver of the Plymouth Acclaim remained in his seated position and was conscious immediately following the crash. He noted steam rising from the front of his vehicle (radiator) and noted a faint gray dust within the vehicle. As he realized the severity of the crash, he unfastened the active belt system and attempted to exit the vehicle. The driver was unable to open the front doors of the vehicle. He immediately climbed into the rear seat area and was unable to open the rear doors. The driver subsequently laid on the rear seat cushion and attempted to kick open the left rear door. A witness opened the left rear door from the outside of the vehicle and assisted the driver from the vehicle. As he exited the Plymouth, the driver felt pain in his chest and lower extremities and realized at this point that he had been injured. He waited outside his vehicle for police and rescue personnel to arrive on-scene.

The driver of vehicle #2 was fatally injured and was removed from her vehicle by rescue personnel.

Police Activities - Numerous police units from the [redacted] Sheriff's Dept. responded to the crash scene to assist with traffic control and the investigation.

Rescue Personnel - Rescue personnel arrived on-scene and immediately assessed the severity of the injuries. They used hydraulic equipment to open and removed the left front door of vehicle #2. The driver was removed from the vehicle and was pronounced dead at the scene. The right front and left rear occupants of vehicle #2 were removed from the vehicle by rescue personnel and were transported to a local hospital. The right rear occupant of vehicle #2 was assisted from the vehicle by witnesses. She was also transported by ambulance to the same hospital for treatment.

The driver of the Plymouth Acclaim was transported by ambulance to the local hospital where he was admitted for 4 days for treatment of his injuries.

Scene Clearance - Both vehicles sustained severe damage from the crash and were towed from the scene.

## HUMAN FACTORS/OCCUPANT DATA

| | Air Bag Vehicle |
|---|---|
| Driver: | 49 year old male |
| Height: | 75" |
| Weight: | 185 lbs. |
| Active Restraint System Usage: | 3-point lap and shoulder belt system |
| Usage Source: | Belt loading evidence, driver injuries, driver interview |
| Eyeglasses: | Prescription sunglasses, separated from face, lens separated from plastic frames |
| Vehicle Familiarity: | 1 week |
| Route Familiarity: | Daily |
| Trip Plan: | En route to work |
| Manner of Leaving Scene: | Ambulance |
| Type of Medical Treatment: | Transported to a local hospital where he was admitted for treatment of his injuries |

## DRIVER INJURIES

| Injury | Severity (OIC/AIS) | Source |
|---|---|---|
| 4 fractured ribs, 3 on left, 1 on right side | Moderate (CBFS-2) | Shoulder belt webbing/ steering assembly |
| Fractured left patella | Moderate (KLFS-2) | Mid instrument panel |
| Ruptured tendon of the right knee | Moderate (KRRM-2) | Knee bolster |
| Fractured left wrist | Moderate (WLFS-2) | Upper instrument panel |
| Fracture of the right 4th and 5th metacarpals | Moderate (WRFS-2, WRFS-2) | Steering wheel rim/ upper instrument panel |
| Contusion around left eye | Minor (FLCO-1) | Eyeglasses/air bag |
| Abrasions of the anterior left leg | Minor (LLAI-1) | Knee bolster |

## DRIVER KINEMATICS

The driver of the 1992 Plymouth Acclaim was in a normal, upright seated position at impact with both hands bracing against the steering wheel. He was properly wearing the active 3-point lap and shoulder belt system with his seat adjusted to the full rearward position. Restraint usage was confirmed by loading evidence found on the belt webbing and system hardware.

As a result of the severe frontal impact sequence, the Plymouth's driver air bag system deployed which provided the driver with additional restraint. He responded to the 11 o'clock impact force and initiated a forward trajectory with respect to the decelerated vehicle. His pelvic and thoracic areas loaded the continuous loop belt webbing which was locked by the inertia activated retractor. The driver's loading force pulled the shoulder belt webbing through the B-pillar mounted D-ring which produced a 3" diagonally orientated plastic transfer on the shoulder belt webbing. His pelvic loading on the lap belt webbing abraded the plastic cover at the outboard side of the seat back/seat cushion juncture. The lap belt webbing also abraded the cinch bar on the latchplate assembly.

The driver attempted to brace against the steering wheel rim with both hands. His left hand separated from the wheel and impacted the upper instrument panel 16.5 - 18.5" left of center. The contact abraded the panel, compressed the energy absorbing material, and displaced the panel upward. As a result of the contact, the driver sustained a fractured left wrist. His right hand separated from the rim and probably impacted the center instrument panel area (no evidence of contact) which fractured his 4th and 5th metacarpals.

The driver's left knee impacted the left mid instrument panel adjacent to the backlight defroster switch. The contact cracked the plastic panel and deposited blue fabric transfers 20 - 23" left of center. As a result of the contact, he sustained a fractured left patella. The driver's lower left leg contacted the left side of the knee bolster at the fuse box cover. The contact produced blue fabric transfers on the struck component 20.5 - 21.5" left of center and abraded the driver's lower leg. His right knee impacted the knee bolster at the protrusion for the steering column and continued across the bolster into the center instrument panel adjacent to the radio. Abrasions and blue fabric transfers evidenced the contact sequence. As a result of the right knee loading, the driver sustained a ruptured tendon of the knee.

The driver was wearing prescription sunglasses as his face contacted the upper surface of the deployed air bag. The contact sequence compressed the eyeglasses against his face which resulted in a contusion around his left eye. The sunglasses were subsequently displaced from his face and were found on the floor with a lens separated from the plastic frames.

The driver's thoracic area subsequently loaded the deployed air bag with sufficient force to compress the bag against the steering wheel. His loading force was transmitted through the compressed air bag and into the steering assembly which resulted in bending of the steering wheel rim and compression of the energy absorbing steering column (2.5"). As a result of his loading against the active belt webbing and the air bag/steering assembly, the driver sustained four fractured ribs. He rebounded into the left front seat back where he came to rest.

The air bag provided the driver with additional restraint that prevented him from directly contacting the steering assembly. The air bag also provided the driver with a sufficient ride down from the severe crash forces which reduced the severity of his injuries.

HUMAN FACTORS/OCCUPANT DATA (CONT'D.)

| | Vehicle #2 |
|---|---|
| Driver: | 59 year old female |
| Height: | 66" (Police estimates) |
| Weight: | 160 lbs. (Police estimates) |
| Active Restraint System Usage: | 3-point lap and shoulder belt, shoulder belt worn loose |
| Usage Source: | Vehicle inspection, police observations |
| Route Familiarity: | Daily |
| Trip Plan: | En route to school |
| Medical Treatment: | Not required, fatal at scene |

DRIVER #2 INJURIES

| Injury | Severity (OIC/AIS) | Source |
|---|---|---|
| Closed head injury, bleeding from nose and mouth | Unknown (HUUU-7) | Steering wheel rim/ spokes |
| Severe thoracic injuries (unspecified) | Unknown (CUUU-7) | Steering wheel |
| Open fracture of the right hip area | Serious (PRFS-3) | Induced fracture from right knee loading into the lower instrument panel |
| Fractured teeth | Minor (FIFS-1) | Steering wheel rim |

DRIVER #2 KINEMATICS

The driver of vehicle #2 was probably in a normal seated position at impact. She was wearing the active 3-point lap and shoulder belt system; however, the shoulder belt was loosely adjusted across her torso. (The driver's husband stated that she routinely wore the shoulder belt loose to prevent the belt from rubbing against her neck.) In response to the 1 o'clock impact force, the driver moved forward and slightly to her right. She loaded the active belt webbing which abraded the upper seat back and the plastic extrusion at the seat cushion/seat back juncture. The improperly adjusted belt webbing did not provide adequate restraint as the driver continued forward into the steering assembly. Her head and facial area impacted the wheel at the upper right spoke area (which was probably rotated CCW at time of contact) and deformed both the rim and spoke 0.75" forward. Tooth fragments were found embedded into the aftermarket steering wheel cover immediately above the upper right spoke. As a result of the contact, the driver sustained fractured teeth and a closed head injury.

DRIVER #2 KINEMATICS (CONT'D.)

The driver's torso subsequently contacted the wheel rim with sufficient force to bend the rim and the lower left spoke 0.75" forward. Her loading force also compressed the energy absorbing steering column 1.5". The driver's knees contacted and fractured the lower instrument panel on each side of the steering column. The energy from the right knee contact was transmitted through the femur and into the right hip which resulted in an open fracture of the right hip area.

The driver rebounded from the contacts and came to rest against the left front seat back with her body slumped to the right. She was removed from the vehicle by rescue personnel and was pronounced dead at the scene.

RIGHT FRONT OCCUPANT DATA

| | |
|---|---|
| Age: | 9 |
| Sex: | Female |
| Height: | Unknown |
| Weight: | Unknown |
| Active Restraint System Usage: | 3-point lap and shoulder belt |
| Usage Source: | Vehicle inspection, passenger injuries, police |
| Manner of Leaving Scene: | Ambulance |
| Type of Medical Treatment: | Admitted to a local hospital for treatment of her injuries |

RIGHT FRONT OCCUPANT INJURIES

| Injury | Severity (OIC/AIS) | Source |
|---|---|---|
| Ruptured spleen | Moderate (MLRQ-2) | Shoulder belt webbing |
| Fractured ribs | Moderate (CUFS-2) | Shoulder belt webbing |

RIGHT FRONT OCCUPANT KINEMATICS

The right front passenger of vehicle #2 was restrained by the active 3-point lap and shoulder belt system. Based upon inspection of the belt webbing and the lack of head and/or thoracic contact points, the passenger was probably wearing the belt system correctly. At impact, she initiated a forward trajectory and loaded the belt webbing. Her loading force against the shoulder belt webbing abraded the right seat back at the apex of the side and top surfaces. The abraded vinyl was embedded into the belt webbing 45-47.5" above the floor anchor assembly. As a result of loading against the shoulder belt webbing, the passenger sustained fractured ribs and a ruptured spleen. The passenger's right knee contacted and

RIGHT FRONT OCCUPANT KINEMATICS (CONT'D.)

deformed the intruding glove box door to a depth of 1" No injury was reported from the contact.

The right front passenger of vehicle #2 was removed from the vehicle by rescue personnel and was transported to a local hospital where she was admitted for treatment of her injuries.

LEFT REAR OCCUPANT DATA

| | |
|---|---|
| Age: | 6 |
| Sex: | Female |
| Height: | Unknown |
| Weight: | Unknown |
| Active Restraint System Usage: | Lap belt |
| Usage Source: | Vehicle inspection, police report |
| Manner of Leaving Scene: | Transported to a local hospital where she was pronounced dead on arrival |

LEFT REAR OCCUPANT INJURIES

| Injury | Severity (OIC/AIS) | Source |
|---|---|---|
| Transection of the cervical spine | Maximum (NPEC-6) | Hyperextension of the neck from loading of the lap belt (Probable) |

LEFT REAR OCCUPANT KINEMATICS

The left rear occupant was in an unknown seated position at impact. She was either holding a pet rabbit in a cardboard cage on her lap or had the cage positioned between her feet on the floor. The 6 year old occupant was wearing the lap belt that was equipped with an outboard mounted locking retractor. At impact, the passenger was thrust forward with respect to the decelerated vehicle and loaded the lap belt with her pelvic/abdominal area. Her unrestrained upper torso pitched forward which resulted in hyperextension of her head and transection of the cervical spinal cord.

It was remotely possible that her head impacted the upper right quadrant of the left front seat back, thus hyperflexing, resulting in the spinal cord injury. Faint transfers (tissue) were noted to the possible area of contact. The front seat assembly was displaced forward; therefore, the left rear occupant would had to have been seated on the forward edge of the rear seat cushion to impact the seat back.

## LEFT REAR OCCUPANT KINEMATICS

The occupant was removed from the vehicle by rescue personnel and transported to a local hospital where she expired on arrival. Her injury was diagnosed by the medical staff. There was no autopsy performed at the request of her family.

## RIGHT REAR OCCUPANT DATA

| | |
|---|---|
| Age: | 4 |
| Sex: | Female |
| Height: | Unknown |
| Weight: | Unknown |
| Active Restraint System Usage: | Lap belt |
| Usage Source: | Vehicle inspection, occupant injuries |
| Manner of Leaving Scene: | Ambulance |
| Type of Medical Treatment: | Admitted to a local hospital for treatment of her injuries and observation |

## RIGHT REAR OCCUPANT INJURIES

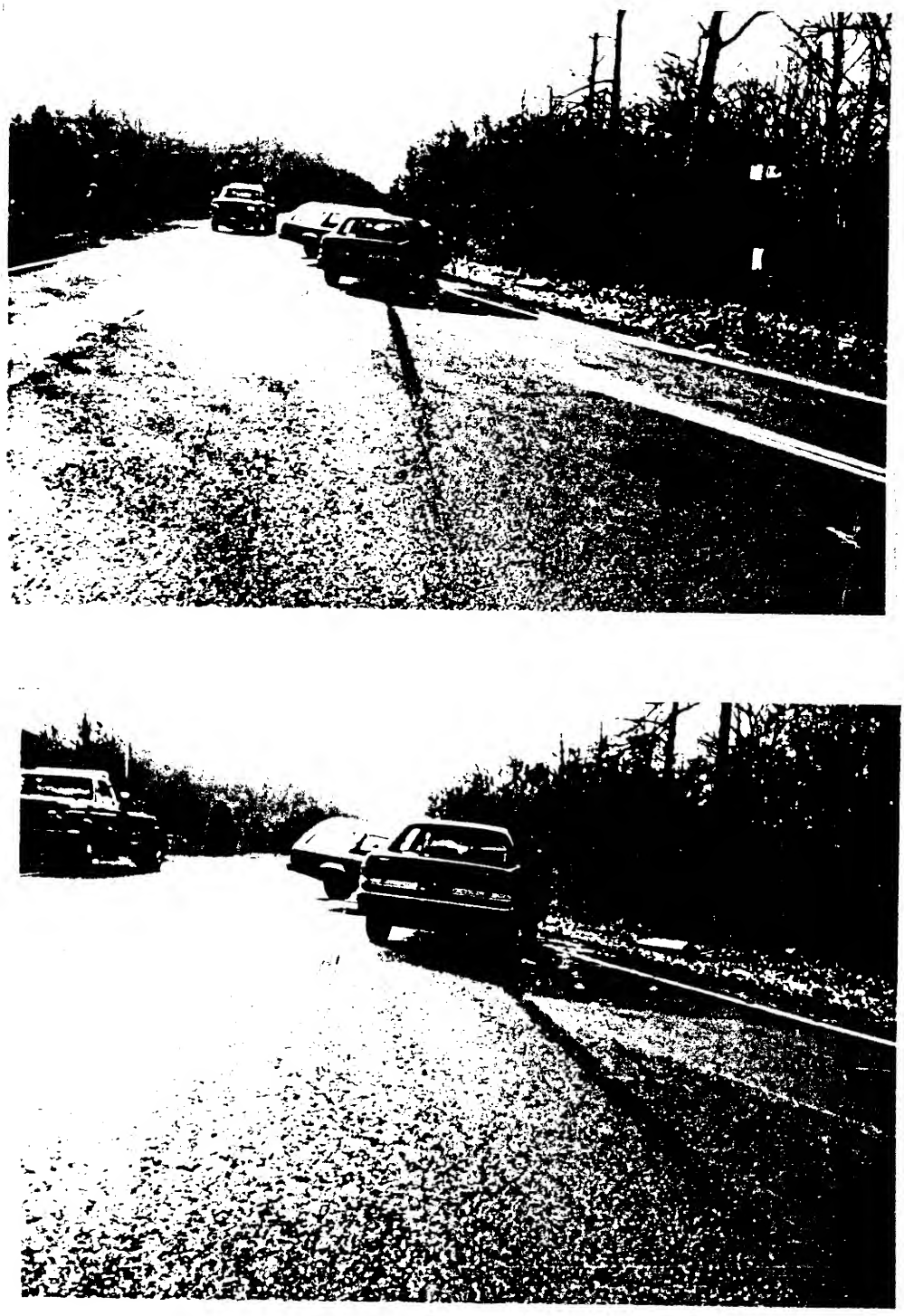
| Injury | Severity (OIC/AIS) | Source |
|---|---|---|
| Kidney contusion | Moderate (MUCK-2) | Lap belt |

## RIGHT REAR OCCUPANT KINEMATICS

The 4 year old right rear occupant was in an unknown seated position and was wearing the lap belt restraint system. Belt usage was determined from a load induced separation of the plastic retainer clip on the outboard (retractor) side of the belt system. The occupant loaded the active belt webbing as she responded to the 1 o'clock impact force. Her loading of the lap belt resulted in a kidney contusion. The belt did prevent the occupant from contact with interior components and additional injury.

The occupant was removed from the vehicle by witnesses to the crash. She was subsequently transported to a local hospital where she was admitted for observation and treatment of her injuries.

ON-SCENE POLICE PHOTOGRAPHS



Pre-Impact Skidding Of The Plymouth And Final Rest Positions Of The Involved Vehicles.

Lateral Displacement Of The Plymouth Acclaim.

Impact Induced Displacement Of The Mercury Zephyr.

Final Rest Positions Of The Involved Vehicles.

SELECTED PRINTS



Pre-Crash Trajectory Of The Plymouth Acclaim.


Plymouth's Trajectory At 100' Pre-Impact.


Beginning Of The Plymouth's Right Front Skid Mark.


Beginning Of The Plymouth's Left Front Skid Mark As The Vehicle Skids In A Tracking Orientation To Impact.

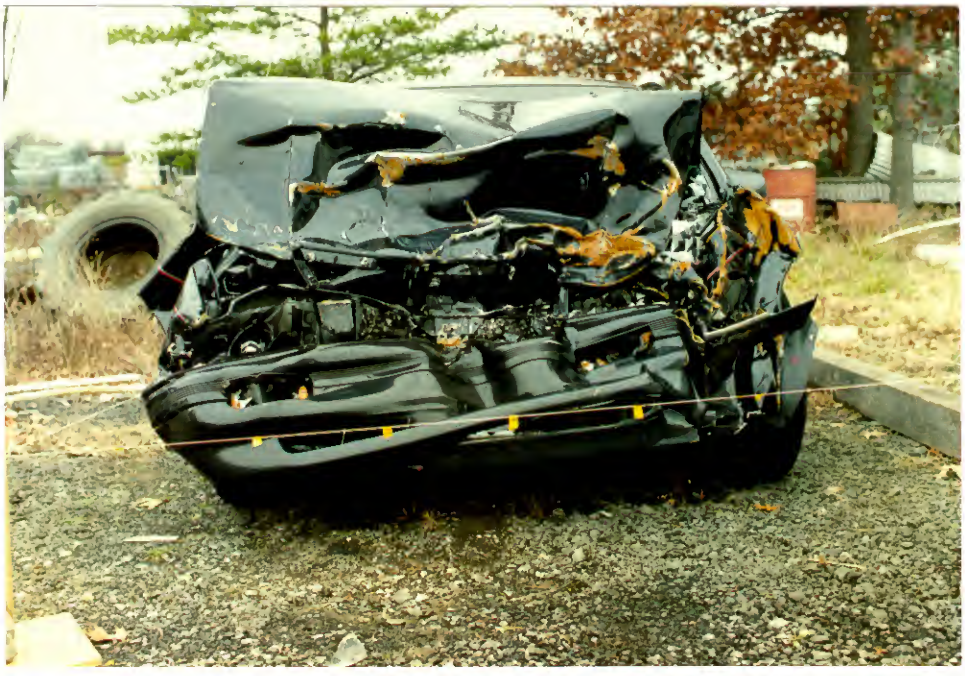

Pre-Crash Trajectory Of Vehicle #2.



Pre-Crash Trajectory Of Vehicle #2.


Vehicle #2's Trajectory At 50' Prior To Impact.

Point Of Impact, Deflection Of The Acclaim's Skid Marks.

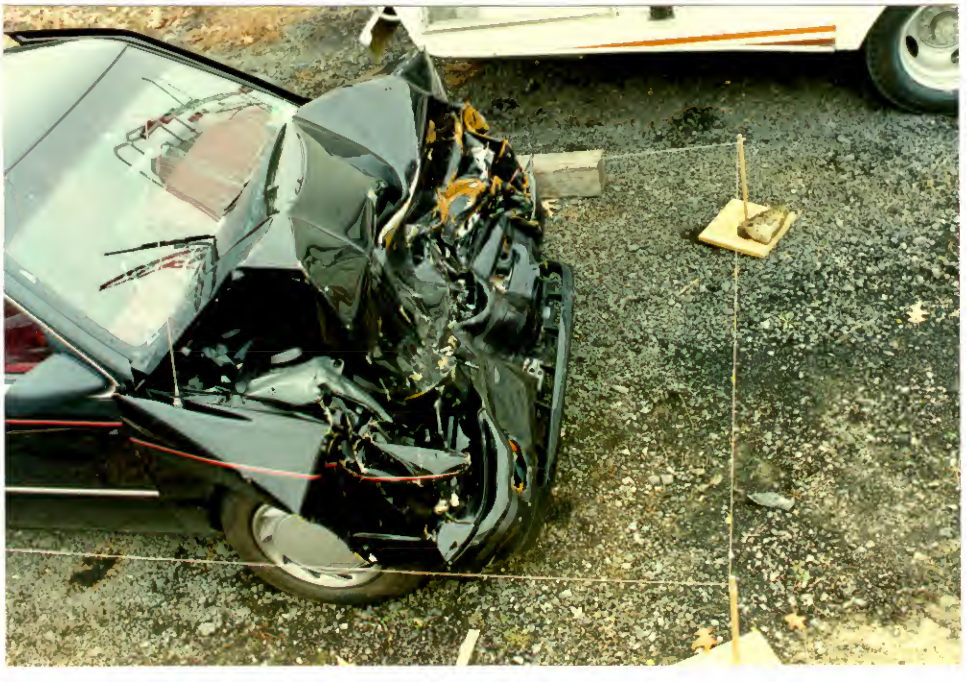


Frontal View Of The Plymouth Acclaim.

Left Front Three-Quarter View Of The Plymouth Acclaim.

Right Front Three-Quarter View Of The Plymouth.

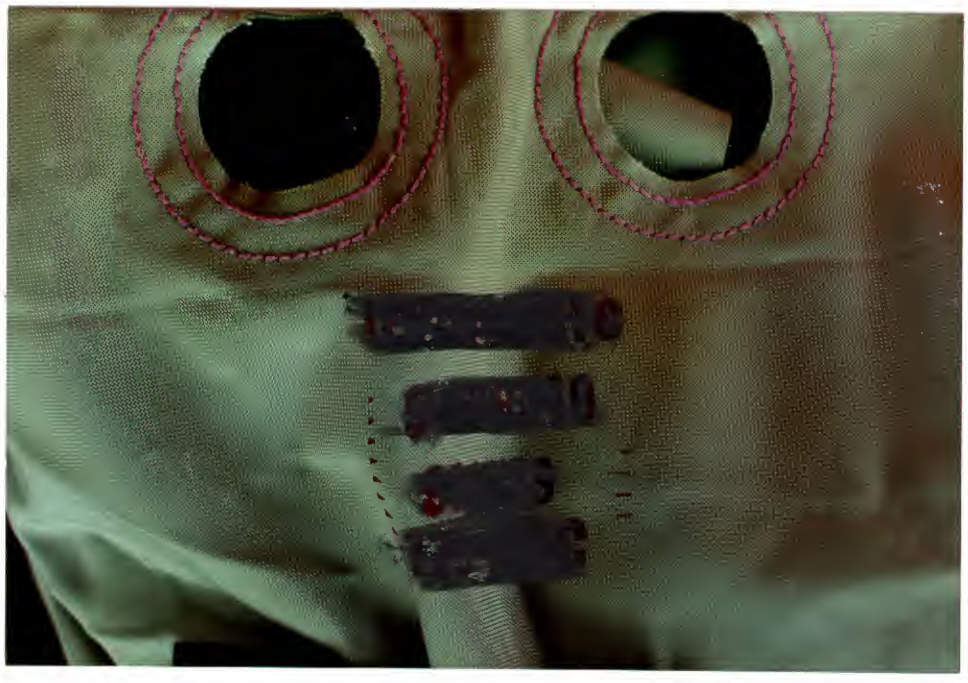
Perpendicular View Of The Right Frontal Area Showing The Extent of Crush.



Overhead Views Showing The Extent of Frontal Crush.

Overall Interior View Of The Deployed Air Bag And Occupant Contact Points.

Deployed Air Bag.



Air Bag Venting Ports and Identification Numbers.

Driver's Left Knee And Leg Contacts To The Mid Instrument Panel and Knee Bolster.


Closeup View Of The Driver's Knee And Leg Contacts.

Driver's Left Hand Contact To The Upper Instrument Panel.

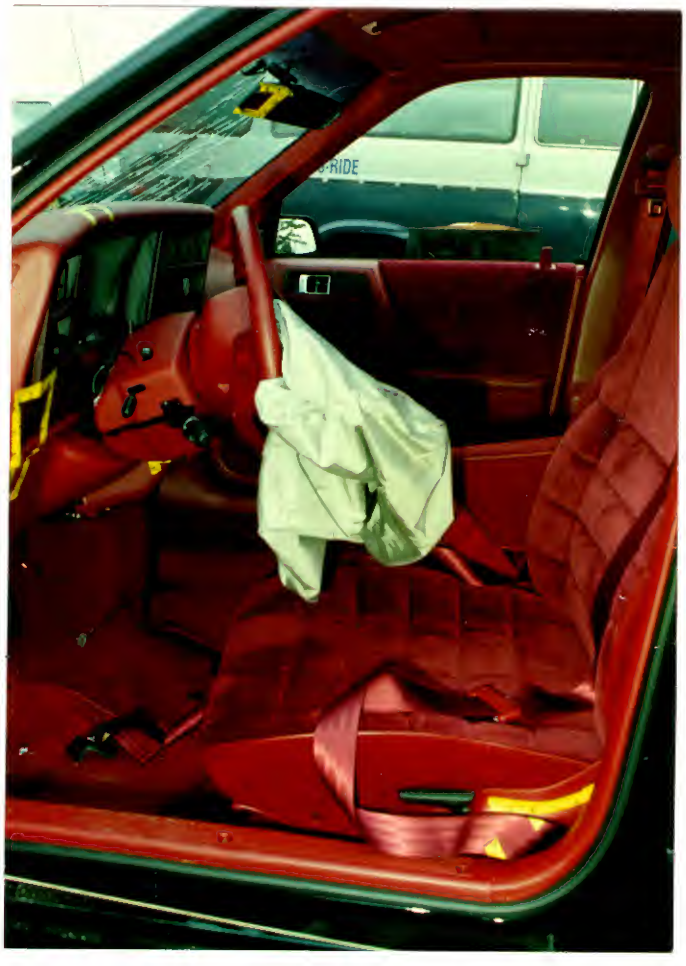
Perpendicular Views Of The Steering Wheel Rim Deformation That Resulted From Driver Loading.


Left Shear Capsule Separation.

Right Shear Capsule Separation.

Driver's Right Knee And Leg Contact To The Knee Bolster.

Closeup View Of The Right Knee Contact



Perpendicular View Of The Driver's Seated Position And Active 3-Point Restraint System

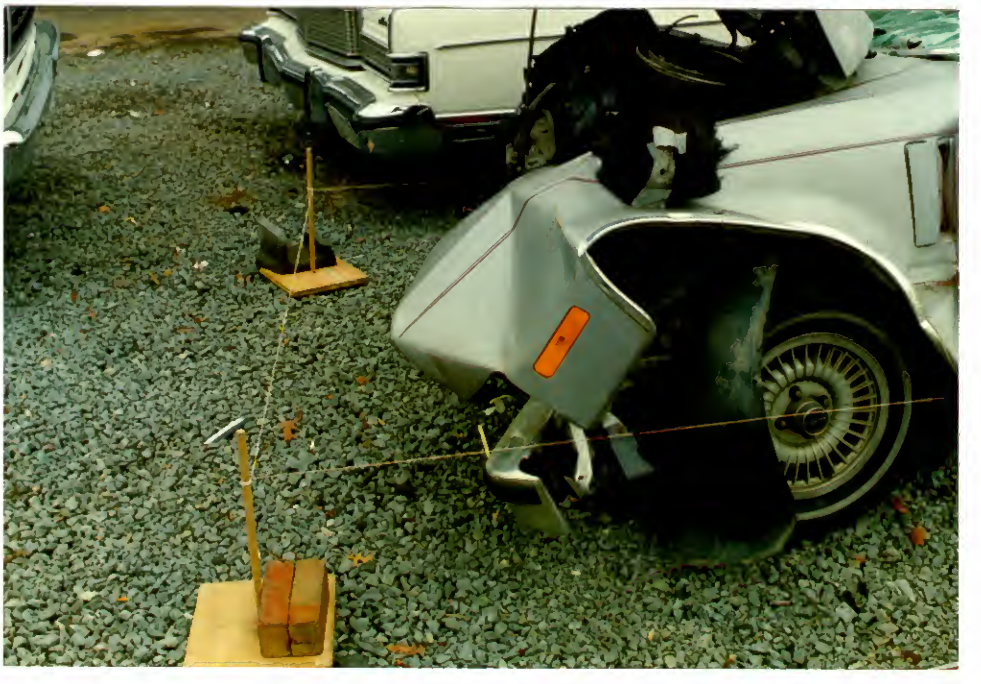
Driver's 3-Point Belt Webbing.


3" Diagonal D-Ring Transfer On The Shoulder Belt Webbing.

Lap Belt Loading Abrasions To The Plastic Extrusion
At The Left Seatback/Seat Cushion Juncture.

Frontal View Of Vehicle #2.

Left Front Three-Quarter View.



Perpendicular View Of The Left Frontal Area Showing The Extent Of Crush.

Left Side View of Vehicle #2.

Right Side View Of The Mercury Zephyr.

Closeup Views Of The Right Frontal Area Showing The Extent of Crush.

Overall Interior Views Of Driver #2's Trajectory And Contact.

Driver's Seated Position And Active Belt System.

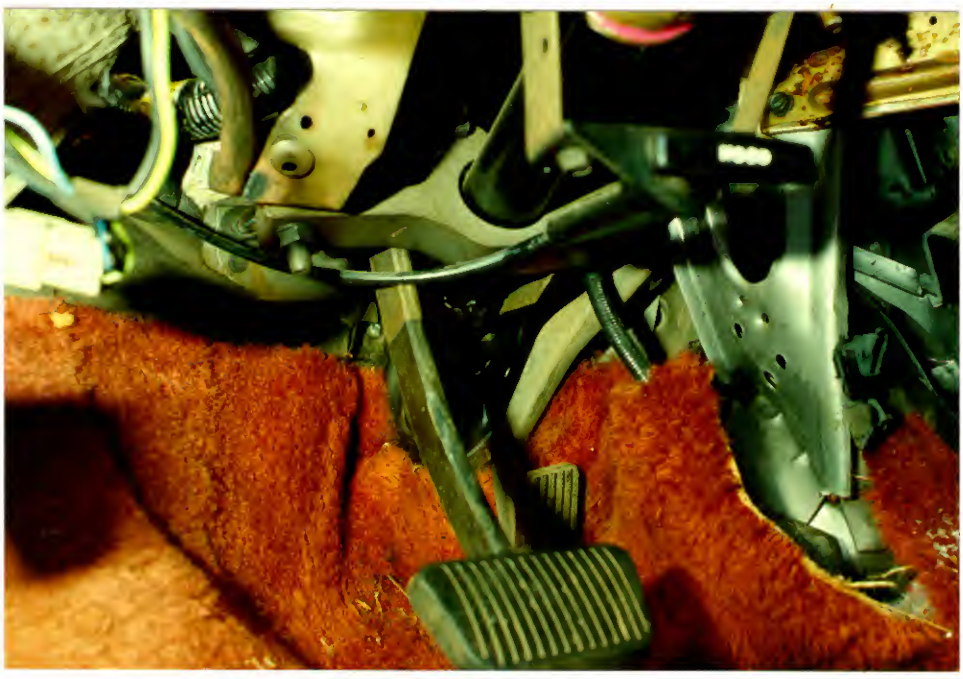
Shoulder Belt Abrasion To The Left Front Seatback.


Lap Belt Abrasion To The Plastic Extrusion At The Seatback/Cushion Juncture.


Driver's Tooth Fragments Embedded Into The Aftermarket Steering Wheel Cover.

Right Front Passenger's Active Belt Webbing And Belt Abrasion To The Right Upper Seatback.

Right Front Passenger's Right Knee Contact To The Glove Box Area.



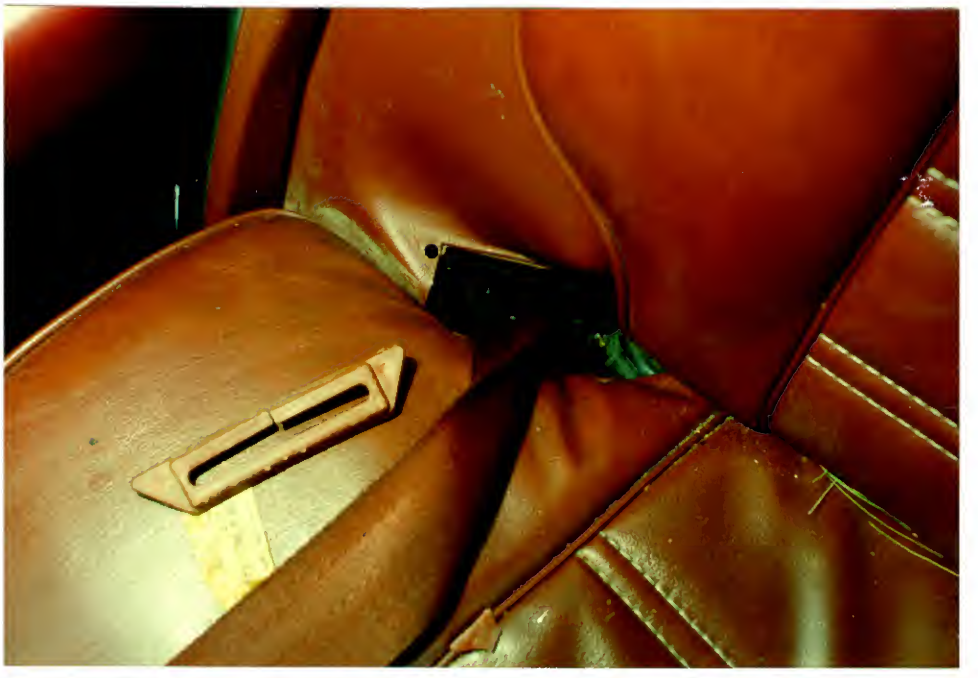
Mercury Zephyr's Steering Column Compression.

Overall View Of The Right Front Occupant's Position and Contact Points.

Rear Seat Views Of The Front Seatbacks And Lap Belt Systems.

Possible Left Rear Occupant's Head Contact To The Front Seatback.

Left Rear Occupant's Loading Damage To The Lap Belt Guide.



Separation Of The Right Rear Belt Guide From Right Rear Occupant Loading.

## SLIDE INDEX

| Slide No(s). | Description |
|---|---|
| 1 | Accident schematic |
| 2 | Driver injury mannequin |
| 3-7 | Pre-crash trajectory of the Plymouth Acclaim |
| 8,9 | Beginning of the Acclaim's skid marks |
| 10 | Point of impact |
| 11 | Lookback view of the vehicle's trajectory |
| 12-15 | Pre-crash trajectory of vehicle #2 |
| 16 | Vehicle #2's heading at point of impact |
| 17 | Lookback view of vehicle #2's trajectory |
| 18-20 | Frontal views of the Plymouth Acclaim |
| 21 | Left front three-quarter view |
| 22,23 | Overhead views showing the extent of crush |
| 24 | Hood contact to the vehicle's windshield |
| 25 | Left side view |
| 26,27 | Rear three-quarter view |
| 28 | Right side view |
| 29,30 | Hood displacement on the Acclaim |
| 31 | Deformed engine compartment |
| 32 | Right front three-quarter view |
| 33 | Perpendicular view showing the extent of crush |
| 34 | Overhead view showing the extent of crush |
| 35 | Overall interior view of the driver contact points and the deployed air bag |
| 36 | Deployed air bag |

SLIDE INDEX (CONT'D.)

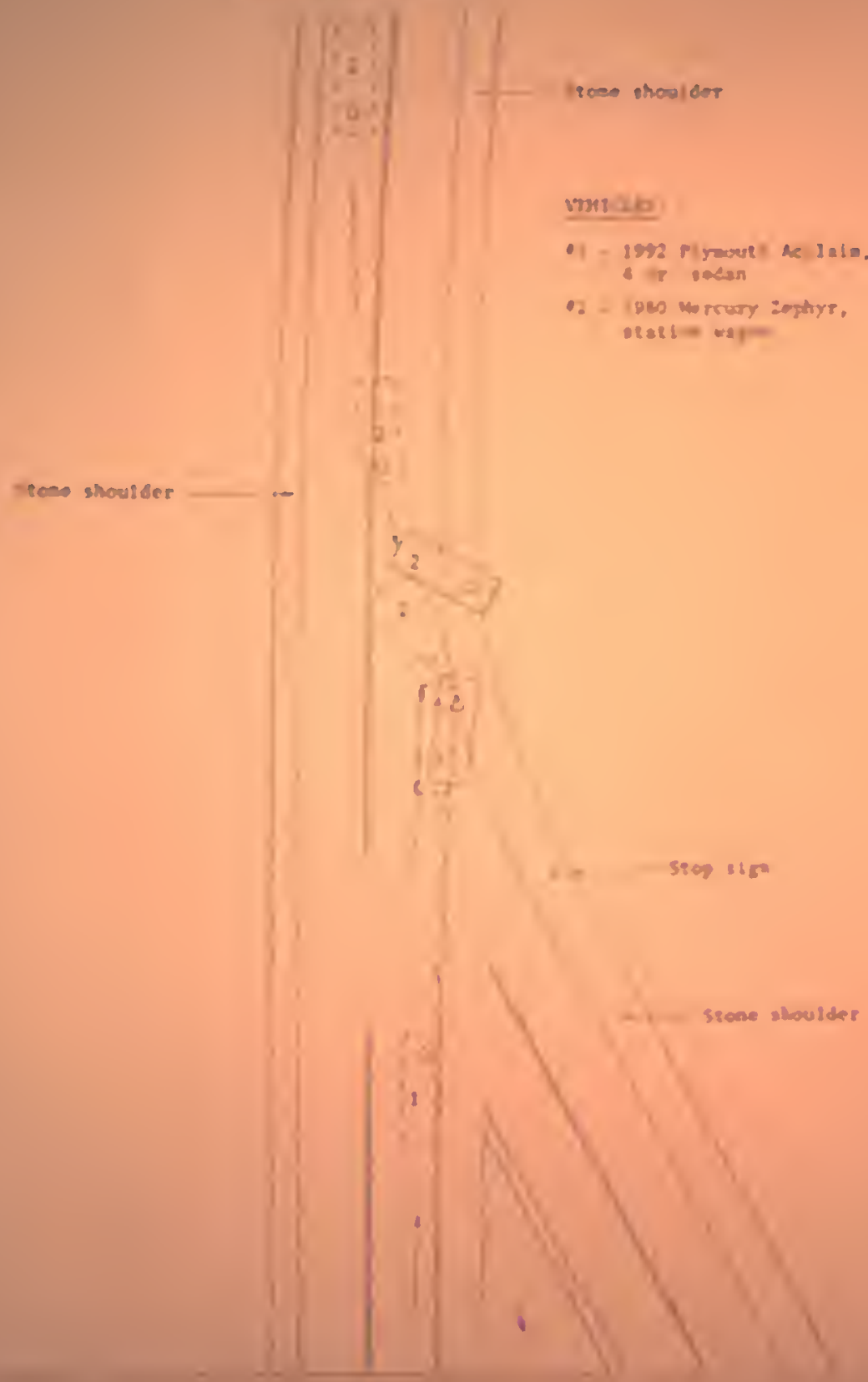
| Slide No(s). | Description |
|---|---|
| 37 | Driver's left hand/wrist contact to upper instrument panel |
| 38 | Perpendicular view of the steering assembly |
| 39 | Forward displacement of the steering column |
| 40 | Shear capsule separation |
| 41,42 | Driver's left knee/lower leg contact |
| 43-45 | Views across the interior from the right door area |
| 46 | Driver's right knee contact to the knee bolster |
| 47 | Steering wheel deformation from driver loading |
| 48 | Driver's seat position and active belt system |
| 49 | Lap belt loading abrasion to the plastic cover |
| 50,51 | D-ring transfer on the shoulder belt webbing |
| 52 | Frontal view of vehicle #2 |
| 53 | Left front three-quarter view |
| 54 | Perpendicular view showing the extent of crush at the left corner |
| 55 | Left side view |
| 56,57 | Rear three-quarter views |
| 58 | Right side view |
| 59-61 | Right front corner views showing the extent of crush |
| 62,63 | Overall views of the driver's seated position and contact points |
| 64 | Driver contact damage to the steering assembly |
| 65 | Tooth fragments embedded into the steering wheel cover |
| 66 | Steering column compression |
| 67 | Driver's seat and active belt webbing |
| 68 | Lap belt abrasion to the plastic cover |
| 69 | Shoulder belt abrasion to the seat back |

## SLIDE INDEX (CONT'D.)

| Slide No(s). | Description |
|---|---|
| 70,71 | Views of the right front occupant's space |
| 72 | Right front occupant's right knee contact to the lower instrument panel area |
| 73,74 | Shoulder belt abrasion to the right front seat back |
| 75 | View of the right front interior from the rear seat area |
| 76 | Rear seat view |
| 77 | Displaced front seat and possible contact points |
| 78 | Left rear lap belt loading damage |
| 79,80 | Probable left rear occupant's head contact to the front seat back |
| 81 | View across the interior from the right rear door area |
| 82 | Right rear lap belt loading damage |

ACCIDENT DIAGRAM

COLLISION CODE NO. 01-14



AGE 49
SEX Male
WT. 185 lbs
HT. 75"

Contusion around left eye (AIS-1), eyeglasses/air bag

4 fractured ribs, [illegible] left side, 1 [illegible] right (AIS-3), shoulder belt webbing/steering assembly

Fractured left wrist (AIS-2), upper instrument panel

Fractures of the right 4th and 5th metacarpals (AIS-2), steering wheel rim, upper instrument panel

Ruptured tendon of the right knee (AIS-2), knee bolster

Fractured left patella (AIS-2), and left instrument panel

Abrasions of the anterior left leg (AIS-1), knee bolster


150'


100'


50'


L F


22'


150'


50'

MANUFACTURE Calspan
CASE NUMBER CA 9114
YEAR 1991

# SLIDES

THE FOLLOWING SLIDE(S) ARE NOT INCLUDED IN THIS CASE:

SLIDE NUMBER(S) * 40


ON/O


5
6
7
8
9

4
5
11
12

5
4
11
12


12


7
8
9
10


11
12
4
5
6
7
8


10
4
5
6
2
11
3
8
9
10

# APPENDIX A

Police Accident Report

BEST AVAILABLE COPY [redacted] DEPARTMENT OF MOTOR VEHICLES

PAGE 1 OF 1 PAGES

# POLICE ACCIDENT REPORT

2 AGENCY COPY FR 300P (REV 7/86)

| ACCIDENT DATE (Month, Day, Year) | DAY OF WEEK | TIME | AM/PM | COUNTY OF ACCIDENT | MILE POST NUMBER | RAILROAD CROSSING ID. NO. IF WITHIN 150 FEET | |
|---|---|---|---|---|---|---|---|
| [redacted] 91 | [redacted] | [redacted] | AM | [redacted] | | | 17 11 |

| CITY OR TOWN | LANDMARKS AT SCENE | NUMBER OF VEHICLES | OFFICIAL USE ONLY | |
|---|---|---|---|---|
| OF X | [redacted] Tele | 2 | 91 [redacted] Time 805 9RD [redacted] | 18 1 |

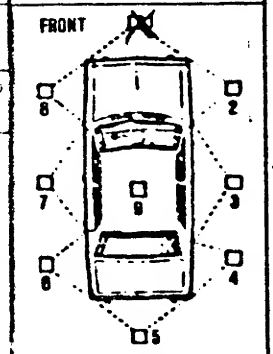
ROUTE NO. OR STREET NAME AT SCENE: Rt [redacted]

AT INTERSECTION WITH OR 32 MILES ✓ FEET N S ✓ E W OF ROUTE NUMBER OR STREET NAME: Rt [redacted]

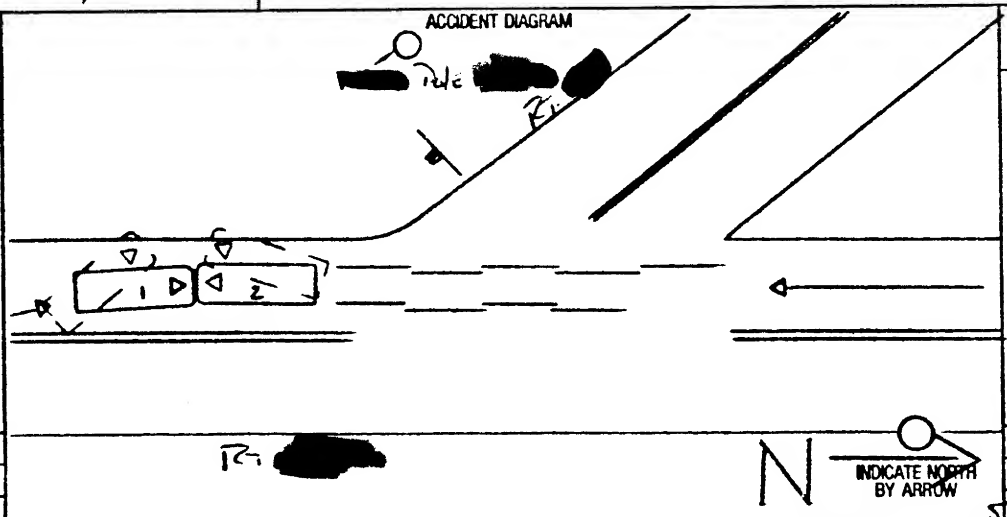
| VEHICLE NO. 1 | | | | VEHICLE NO. 2 (OR PEDESTRIAN) | | | |
|---|---|---|---|---|---|---|---|
| DRIVER'S NAME (LAST, FIRST, MIDDLE) | | OCCUPATION | | DRIVER'S NAME (LAST, FIRST, MIDDLE) | | OCCUPATION | |
| [redacted] | | TEACHER | | [redacted] | | MARKETING EXEC. | |
| ADDRESS (STREET & NO.) | | YEARS OF DRIVING EXPERIENCE | | ADDRESS (STREET & NO.) | | YEARS OF DRIVING EXPERIENCE | 19 3 |
| [redacted] | | UNK | | [redacted] | | 33 | |
| CITY | STATE | ZIP CODE | | CITY | STATE | ZIP CODE | 20 1 |
| [redacted] | MD | [redacted] | | [redacted] | [redacted] | [redacted] | |
| DATE OF BIRTH (Month, Day, Year) | SEX | DRIVER'S LICENSE NUMBER | STATE | DATE OF BIRTH (Month, Day, Year) | SEX | DRIVER'S LICENSE NUMBER | STATE |
| [redacted] | F | [redacted] | MD | [redacted] | M | [redacted] | VA 21 3 |
| VEHICLE OWNER'S NAME (LAST, FIRST, MIDDLE) | | | | VEHICLE OWNER'S NAME (LAST, FIRST, MIDDLE) | | | 22 X |
| [redacted] | | | | [redacted] | | | |
| ADDRESS (STREET & NO.) | | | | ADDRESS (STREET & NO.) | | | 23 X |
| [redacted] | | | | [redacted] | | | |
| CITY | STATE | ZIP CODE | | CITY | STATE | ZIP CODE | |
| [redacted] | [redacted] | [redacted] | | [redacted] | [redacted] | [redacted] | |
| MAKE & TYPE OF VEHICLE (SHOW MOPED, MOTORCYCLE, AMBULANCE, ETC.) | YEAR | REPAIR COST | | MAKE & TYPE OF VEHICLE (SHOW MOPED, MOTORCYCLE, AMBULANCE, ETC.) | YEAR | REPAIR COST | 24 X |
| Mercury 4D S. Wgn | 80 | 3500 | | Plymouth 4 D. | 92 | 15,000 | |
| LICENSE PLATE NUMBER | STATE | NAME OF INSURANCE CO. (NOT AGENT) | | LICENSE PLATE NUMBER | STATE | NAME OF INSURANCE CO. (NOT AGENT) | 25 X |
| [redacted] | MD | [redacted] | | [redacted] | VA | [redacted] | |

| DAMAGE TO PROPERTY OTHER THAN VEHICLES | OBJECT STRUCK (TREE, FENCE, ETC.) | OWNER'S NAME (LAST, FIRST, MIDDLE) | ADDRESS | REPAIR COST | |
|---|---|---|---|---|---|
| | X | X | | X | 26 U |

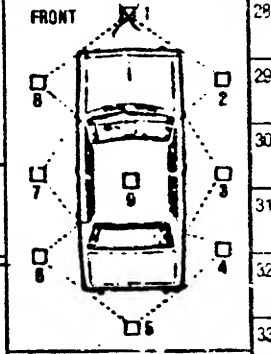
VEHICLE NO. 1 DAMAGE CHECK POINTS OF IMPACT




ACCIDENT DIAGRAM




VEHICLE NO. 2 DAMAGE CHECK POINTS OF IMPACT




27 1 | 29 U | 29 1 | 30 X | 31 1 | 32 1 | 33 X

| SPEED | BEFORE ACCIDENT | LIMIT | MAXIMUM SAFE |
|---|---|---|---|
| VEHICLE NO. 1 | 40-45 | 55 | 0 |
| VEHICLE NO. 2 | 55-60 | 55 | 55 |

| VEHICLE NO. 1 DAMAGES: | | | | | | VEHICLE NO. 2 DAMAGES: | | | | | | 34 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 UNKNOWN | 2 NO DAMAGE | OVERTURNED 3 | UNDERCARRIAGE 5 | BY FIRE 7 | | 1 UNKNOWN | 2 NO DAMAGE | OVERTURNED 3 | UNDERCARRIAGE 5 | BY FIRE 7 | |
| | | MOTOR 4 | ✓ TOTALED 6 | OTHER 8 | | | | MOTOR 4 | ✓ TOTALED 6 | OTHER 8 | |

ACCIDENT DESCRIPTION: VEHICLE #1 WAS NORTHBOUND ON Rt [redacted] JUST SOUTH OF Rt [redacted] DRIVER #1 ATTEMPTED TO MAKE A LEFT TURN ACROSS THE SOUTHBOUND LANE OF Rt [redacted] VEHICLE #1 WAS STRUCK HEAD ON BY VEHICLE #2. 35 1 | 36 X | 37 2

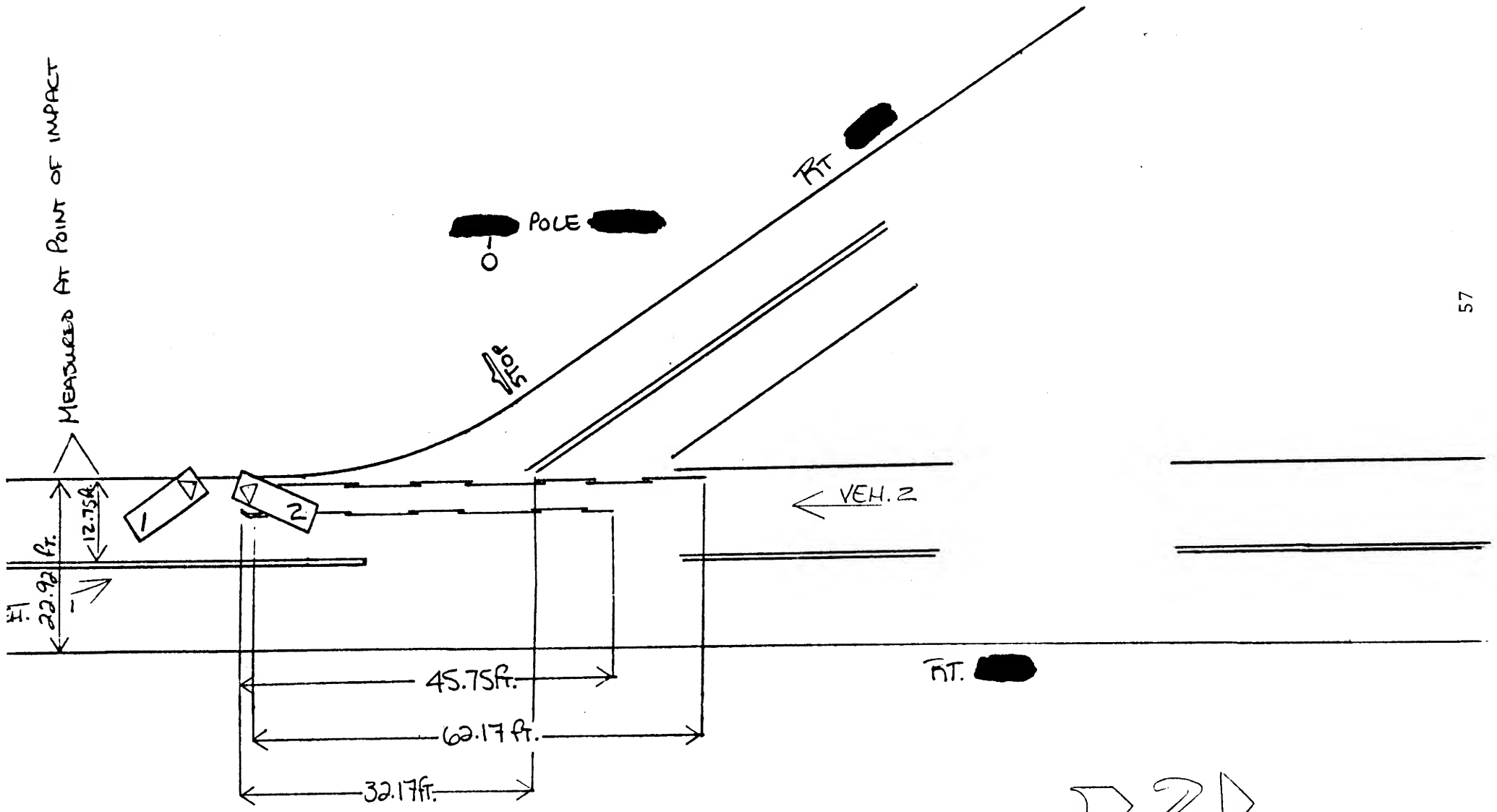
OFFENSES CHARGED DRIVER: NONE

| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | NAMES OF INJURED - IF DECEASED, INCLUDE DATE OF DEATH |
|---|---|---|---|---|---|---|---|---|
| A 2 | 1 | 6 | 1 | 06115142 | M | 4 | X | [redacted] |
| B 1 | 1 | 4 | 1 | 05109132 | F | 1 | X | [redacted] |
| C 1 | 4 | 2 | 1 | 09117185 | F | 5 | X | [redacted] |
| D 1 | 3 | 4 | 1 | 06130182 | F | 2 | X | [redacted] |
| 1 | 6 | 2 | 1 | 03175187 | F | 4 | X | [redacted] |

| TROOPER/OFFICER'S NAME | BADGE/CODE NUMBER | DEPARTMENT NAME AND CODE NUMBER | REVIEWING OFFICER | DATE REPORT FILED |
|---|---|---|---|---|
| [redacted] | [redacted] | [redacted] | | |

[redacted]

TIME [redacted] HRS




57

21

IF A QUESTION DOES NOT APPLY, ENTER AN "X". IF AN ANSWER IS UNKNOWN, ENTER A "U". "OTHER" EXPLAIN IN ACCIDENT DESCRIPTION FR 300P 1/78

**1 TRAFFIC CONTROL**
1 NO TRAFFIC CONTROL
2 OFFICER OR WATCHMAN
3 TRAFFIC SIGNAL
4 STOP SIGN
5 SLOW OR WARNING SIGN
6 TRAFFIC LANES MARKED
7 NO PASSING LINES
8 YIELD SIGN
9 ONE WAY ROAD OR STREET
10 RAILROAD CROSSING WITH MARKINGS AND SIGNS
11 RAILROAD CROSSING WITH SIGNALS
12 RAILROAD CROSSING WITH GATE AND SIGNALS
13 OTHER

**2 WAS TRAFFIC CONTROL DEVICE WORKING BEFORE ACCIDENT?**
1 YES
2 NO

**3 ALIGNMENT**
1 STRAIGHT - LEVEL
2 CURVE - LEVEL
3 GRADE - STRAIGHT
4 GRADE - CURVE
5 HILLCREST - STRAIGHT
6 HILLCREST - CURVE
7 DIP - STRAIGHT
8 DIP - CURVE
9 OTHER

**4 WEATHER**
1 CLEAR
2 CLOUDY
3 FOG
4 MIST
5 RAINING
6 SNOWING
7 SLEETING
8 SMOKE - DUST
9 OTHER

**5 SURFACE CONDITION**
1 DRY
2 WET
3 SNOWY
4 ICY
5 MUDDY
6 OILY
7 OTHER

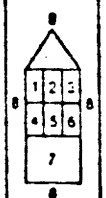
**6 ROADWAY DEFECTS**
1 NO DEFECTS
2 HOLES, RUTS, BUMPS
3 SOFT OR LOW SHOULDER
4 UNDER REPAIR
5 LOOSE MATERIAL
6 RESTRICTED WIDTH
7 SLICK PAVEMENT
8 ROADWAY OBSTRUCTED
9 OTHER DEFECTS

**7 LIGHT**
1 DAWN
2 DAYLIGHT
3 DUSK
4 DARKNESS - STREET OR HIGHWAY LIGHTED
5 DARKNESS - STREET OR HIGHWAY NOT LIGHTED

**8 ROAD OR LOCALITY**
1 SCHOOL
2 CHURCH
3 PLAYGROUND
4 OPEN COUNTRY
5 BUSINESS/INDUSTRIAL
6 RESIDENTIAL
7 INTERSTATE
8 OTHER

**WHICH VEHICLE OCCUPIED**
1 VEHICLE NO. 1
2 VEHICLE NO. 2
B BICYCLIST
P PEDESTRIAN
O OTHER

**POSITION IN/ON VEHICLE**
1 DRIVER
2-7 PASSENGERS
8 RIDING/HANGING ON OUTSIDE




**SAFETY EQUIPMENT USED**
1 NO RESTRAINT USED
2 LAP BELT
3 HARNESS
4 LAP BELT AND HARNESS
5 CHILD RESTRAINT
6 AIR BAG
7 OTHER

**EJECTION FROM VEHICLE**
1 NOT EJECTED
2 PARTIALLY EJECTED
3 EJECTED

| BIRTH DATE MONTH DAY YEAR | SEX M/F |
|---|---|
| | |

**DRIVER'S ACTION**
1 NONE
2 EXCEEDED SPEED LIMIT
3 EXCEEDED SAFE SPEED BUT NOT SPEED LIMIT
4 OVERTAKING ON HILL
5 OVERTAKING ON CURVE
6 OVERTAKING AT INTERSECTION
7 IMPROPER PASSING OF SCHOOL BUS
8 CUTTING IN
9 OTHER IMPROPER PASSING
10 WRONG SIDE OF ROAD - NOT OVERTAKING
11 DID NOT HAVE RIGHT OF WAY
12 FOLLOWING TOO CLOSE
13 FAIL TO SIGNAL OR IMPROPER SIGNAL
14 IMPROPER TURN - WIDE RIGHT TURN
15 IMPROPER TURN - CUT CORNER ON LEFT TURN
16 IMPROPER TURN FROM WRONG LANE
17 OTHER IMPROPER TURNING
18 IMPROPER BACKING
19 IMPROPER START FROM PARKED POSITION
20 DISREGARDED OFFICER OR WATCHMAN
21 DISREGARDED STOP - GO LIGHT
22 DISREGARDED STOP OR YIELD SIGN
23 DRIVER INATTENTION
24 FAIL TO STOP AT THROUGH HIGHWAY - NO SIGN
25 DRIVE THROUGH SAFETY ZONE
26 FAIL TO SET OUT FLARES OR FLAGS
27 FAIL TO DIM HEADLIGHTS
28 DRIVING WITHOUT LIGHTS
29 IMPROPER PARKING LOCATION
30 AVOIDING PEDESTRIAN
31 AVOIDING OTHER VEHICLE
32 AVOIDING ANIMAL
33 DROVE OFF ROADWAY
34 HIT AND RUN
35 CAR RAN AWAY - NO DRIVER
36 BLINDED BY LIGHTS
37 OTHER VIOLATIONS

VEHICLE NO 1 17
VEHICLE NO 2 18

**VEHICLE MANEUVER**
1 GOING STRAIGHT AHEAD
2 MAKING RIGHT TURN
3 MAKING LEFT TURN
4 MAKING U - TURN
5 SLOWING OR STOPPING
6 STARTING IN TRAFFIC LANE
7 STARTING FROM PARKED POSITION
8 STOPPED IN TRAFFIC LANE
9 RAN OFF ROAD - RIGHT
10 RAN OFF ROAD - LEFT
11 PARKED
12 BACKING
13 PASSING
14 CHANGING LANES
15 OTHER

VEHICLE NO 1 19
VEHICLE NO 2 20

**TYPE OF COLLISION**
1 REAR END
2 ANGLE
3 HEAD ON
4 SIDESWIPE - SAME DIRECTION
5 SIDESWIPE - OPPOSITE DIRECTION
6 FIXED OBJECT IN ROAD
7 TRAIN
8 NON - COLLISION
9 FIXED OBJECT - OFF ROAD
10 DEER
11 OTHER ANIMAL
12 PEDESTRIAN
13 BICYCLIST
14 MOTORCYCLIST
15 JACKED INTO
16 OTHER

FIRST EVENT
SECOND EVENT

VEHICLE WITH 21
VEHICLE NO 1 22
VEHICLE NO 2 23

**COLLISION WITH FIXED OBJECT**
1 BANK OR LEDGE
2 TREES
3 UTILITY POLE
4 FENCE OR FENCE POST
5 GUARD RAIL OR POST
6 PARKED VEHICLE
7 BRIDGE, UNDERPASS, CULVERT, ETC.
8 SIGN, TRAFFIC SIGNAL
9 IMPACT CUSHIONING DEVICE
10 OTHER

VEHICLE NO 1 24
VEHICLE NO 2 25

**DRIVER VISION OBSCURED**
1 NOT OBSCURED
2 RAIN, SNOW, ETC. ON WINDSHIELD
3 WINDSHIELD OTHERWISE OBSCURED
4 VISION OBSCURED BY LOAD ON VEHICLE
5 TREES, CROPS, ETC
6 BUILDING
7 EMBANKMENT
8 SIGNBOARD
9 HILL CREST
10 PARKED VEHICLES
11 MOVING VEHICLES
12 SUN OR HEADLIGHT GLARE
13 OTHER

VEHICLE NO 1 26
VEHICLE NO 2 27

COMMONWEALTH OF VIRGINIA
DIVISION OF MOTOR VEHICLES

# POLICE ACCIDENT REPORT

**INJURY TYPE**
1 DEAD BEFORE REPORT MADE
2 VISIBLE SIGNS OF INJURY, AS BLEEDING, WOUND OR DISTORTED MEMBER, OR HAD TO BE CARRIED FROM SCENE
3 OTHER VISIBLE INJURY, AS BRUISES, ABRASIONS, SWELLING, LIMPING, ETC
4 NO VISIBLE INJURY BUT COMPLAINT OF PAIN OR MOMENTARY UNCONSCIOUSNESS

**PEDESTRIAN ACTIONS**
1 CROSSING AT INTERSECTION - WITH SIGNAL
2 CROSSING AT INTERSECTION - AGAINST SIGNAL
3 CROSSING AT INTERSECTION - NO SIGNAL
4 CROSSING AT INTERSECTION - DIAGONALLY
5 CROSSING NOT AT INTERSECTION - RURAL
6 CROSSING NOT AT INTERSECTION - URBAN
7 COMING FROM BEHIND PARKED CARS
8 GETTING ON OR ON SCHOOL BUS
9 PLAYING IN ROADWAY
10 GETTING OFF OR ON OTHER VEHICLE
11 HITCHING ON VEHICLE
12 WALKING IN ROADWAY WITH TRAFFIC - SIDEWALKS AVAILABLE
13 WALKING IN ROADWAY WITH TRAFFIC - SIDEWALKS NOT AVAILABLE
14 WALKING IN ROADWAY AGAINST TRAFFIC - SIDEWALKS AVAILABLE
15 WALKING IN ROADWAY AGAINST TRAFFIC - SIDEWALKS NOT AVAILABLE
16 WORKING IN ROADWAY
17 STANDING IN ROADWAY
18 LYING IN ROADWAY
19 NOT IN ROADWAY
20 OTHER

**CONDITION OF DRIVERS AND PEDESTRIAN**
1 NO DEFECTS
2 EYESIGHT DEFECTIVE
3 HEARING DEFECTIVE
4 OTHER BODY DEFECTS
5 ILL
6 FATIGUED
7 APPARENTLY ASLEEP
8 OTHER HANDICAP

VEHICLE NO 1 28
VEHICLE NO 2 29
PEDESTRIAN 30

**DRINKING**
1 HAD NOT BEEN DRINKING
2 DRINKING - OBVIOUSLY DRUNK
3 DRINKING - ABILITY IMPAIRED
4 DRINKING - ABILITY NOT IMPAIRED
5 DRINKING - NOT KNOWN WHETHER IMPAIRED

VEHICLE NO 1 31
VEHICLE NO 2 32
PEDESTRIAN 33

**VEHICLE CONDITION**
1 NO DEFECTS
2 LIGHTS DEFECTIVE
3 BRAKES DEFECTIVE
4 STEERING DEFECTIVE
5 PUNCTURE OR BLOWOUT
6 WORN OR SLICK TIRES
7 MOTOR TROUBLE
8 CHAINS IN USE
9 OTHER DEFECTS

VEHICLE NO 1 34
VEHICLE NO 2 35

**SKIDDING**
1 BEFORE APPLICATION OF BRAKES
2 AFTER APPLICATION OF BRAKES
3 BEFORE AND AFTER APPLICATION OF BRAKES

VEHICLE NO 1 36
VEHICLE NO 2 37

6 10 11 12 13 14 15 16

NAMES OF INJURED IF DECEASED, INCLUDE DATE OF DEATH

# APPENDIX B

CRASHPC Output

CRASH3 RECONSTRUCTION

| | | TOTAL(MPH) | LONG.(MPH), | LAT.(MPH) | |
|---|---|---|---|---|---|
| IMPACT SPEED (LINEAR MOMENTUM AND SPINOUT) | VEH #1 | 44.9 | 44.9 | .0 | |
| | VEH #2 | 32.1 | 32.1 | .0 | |
| | | TOTAL(MPH) | LONG.(MPH) | LAT.(MPH) | ANG.(DEG) |
| SPEED CHANGE (DAMAGE) | VEH #1 | 38.1 | -37.3 | 7.8 | -11.8 |
| | VEH #2 | 34.3 | -32.8 | -9.9 | 16.8 |
| (LINEAR MOMENTUM AND SPINOUT) | VEH #1 | 39.6 | -39.3 | 5.5 | -8.0 |
| | VEH #2 | 35.7 | -33.4 | -12.5 | 20.5 |

ENERGY DISSIPATED BY DAMAGE VEH#1:136544.7 FT-LB VEH#2:148522.7 FT-LB

SCENE INFORMATION

| | VEHICLE # 1 | VEHICLE # 2 |
|---|---|---|
| IMPACT X-POSITION | 11.00 FT. | 25.90 FT. |
| IMPACT Y-POSITION | 10.10 FT. | 6.50 FT. |
| IMPACT HEADING ANGLE | 3.50 DEG. | 155.00 DEG. |
| REST X-POSITION | 12.60 FT. | 33.10 FT. |
| REST Y-POSITION | 13.20 FT. | 15.30 FT. |
| REST HEADING ANGLE | 12.00 DEG. | 117.00 DEG. |
| DIRECTION OF ROTATION | CW | CCW |
| AMOUNT OF ROTATION | <360 | <360 |

COLLISION CONDITIONS

| VEHICLE # 1 | | | VEHICLE # 2 | | |
|---|---|---|---|---|---|
| XC10' | = | 11.0 FT. | XC20' | = | 25.9 FT. |
| YC10' | = | 10.1 FT. | YC20' | = | 6.5 FT. |
| PSI10 | = | 3.5 DEG. | PSI20 | = | 155.0 DEG. |
| PSI1DO | = | .0 DEG/SEC | PSI2DO | = | .0 DEG/SEC |
| BETA1 | = | .0 DEG. | BETA2 | = | .0 DEG. |

SEPARATION CONDITIONS (USING SPINOUT)

| VEHICLE # 1 | | | VEHICLE #2 | | |
|---|---|---|---|---|---|
| US1 | = | 5.7 MPH | US2 | = | -1.3 MPH |
| VS1 | = | 5.5 MPH | VS2 | = | -12.5 MPH |
| PSISD1 | = | 21.0 DEG/SEC | PSISD2 | = | -45.2 DEG/SEC |

| RELATIVE VELOCITY (LINEAR MOMENTUM) | VEHICLE #1 | VEHICLE # |
|---|---|---|
| SPEED ALONG LINE THRU CG: | 42.9 MPH | 31.5 MP |
| SPEED ORTHOG. TO CG LINE: | 13.2 MPH | -6.4 MP |

CLOSING VELOCITY (LINEAR MOMENTUM) : 74.4 MPH

## DIMENSIONS AND INERTIAL PROPERTIES

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A1 | = | 51.3 | IN. | A2 | = | 51.3 | IN. |
| B1 | = | 55.5 | IN. | B2 | = | 55.5 | IN. |
| TR1 | = | 58.9 | IN. | TR2 | = | 58.9 | IN. |
| I1 | = | 25660.3 | LB-SEC**2-IN | I2 | = | 28521.1 | LB-SEC**2-IN |
| M1 | = | 7.720 | LB-SEC**2/IN | M2 | = | 8.580 | LB-SEC**2/IN |
| XF1 | = | 89.8 | IN. | XF2 | = | 89.8 | IN. |
| XR1 | = | -106.4 | IN. | XR2 | = | -106.4 | IN. |
| YS1 | = | 36.3 | IN. | YS2 | = | 36.3 | IN. |

## ROLLING RESISTANCE

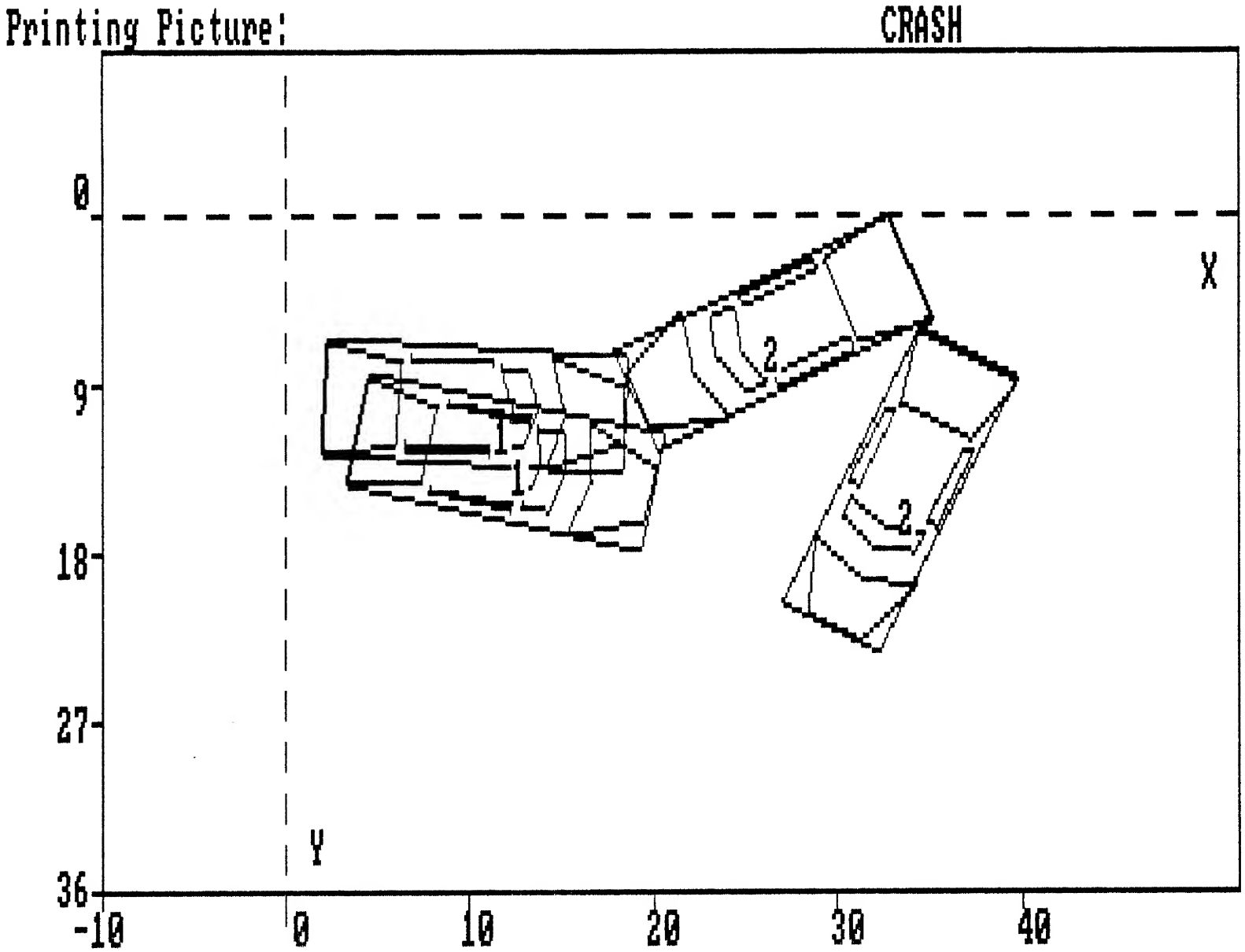
| VEHICLE # 1 | | VEHICLE # 2 | |
|---|---|---|---|
| LF---------- | .50 | LF---------- | .70 |
| RF---------- | .50 | RF---------- | 1.00 |
| LR---------- | .02 | LR---------- | .30 |
| RR---------- | .02 | RR---------- | .30 |
| MU---------- | .75 | | |

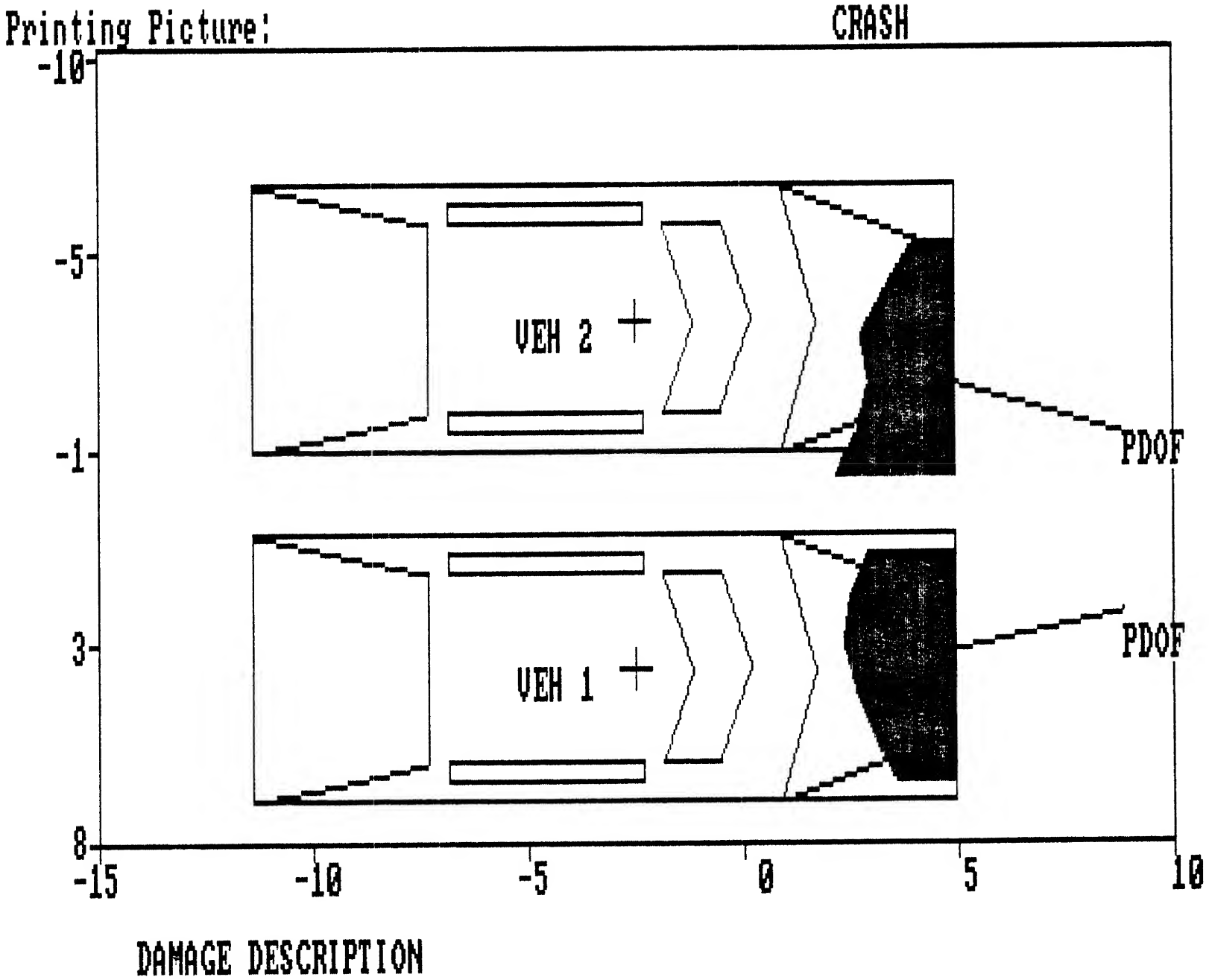
PRESS ANY KEY TO CONTINUE

## SUMMARY OF DAMAGE DATA

(* INDICATES DEFAULT VALUE)

| VEHICLE # 1 | | | VEHICLE # 2 | | |
|---|---|---|---|---|---|
| TYPE--------CATEGORY | 3 | | TYPE--------CATEGORY | 3 | |
| STIFFNESS---CATEGORY | 9 | | STIFFNESS---CATEGORY | 3 | |
| WEIGHT------ | 2969.0 | LBS. | WEIGHT------- | 3300.0 | LBS. |
| CDC---------- | 11FDEW3 | | CDC---------- | 01FDEW4 | |
| L---------- | 62.0 | IN. | L---------- | 65.0 | IN. |
| C1---------- | 24.5 | IN. | C1---------- | 11.6 | IN. |
| C2---------- | 29.5 | IN. | C2---------- | 19.2 | IN. |
| C3---------- | 31.0 | IN. | C3---------- | 26.1 | IN. |
| C4---------- | 28.0 | IN. | C4---------- | 24.0 | IN. |
| C5---------- | 23.6 | IN. | C5---------- | 27.4 | IN. |
| C6---------- | 16.9 | IN. | C6---------- | 33.6 | IN. |
| D---------- | .0 | | D---------- | 11.4 | |
| RHO---------- | 1.00 | * | RHO---------- | 1.00 | * |
| ANG---------- | -11.8 | DEG. | ANG---------- | 16.8 | DEG. |
| D'---------- | -1.7 | IN. | D'---------- | 15.2 | IN. |


Printing Picture:
CRASH
0
9
18
27
36
X
Y
-10
0
10
20
30
40
1
1
2
2
SCENE DESCRIPTION


Printing Picture:
CRASH
-10
-5
-1
3
8
VEH 2
VEH 1
PDOF
PDOF
-15
-10
-5
0
5
10
DAMAGE DESCRIPTION

# APPENDIX C

## Air Bag Supplement

Dup. Cols. 1-8 from prior card | Module A B | Format 0 1 | AIRBAG SUPPLEMENT | AB-1

ACCIDENT SUMMARY

ACCIDENT DATE [redacted]/91

POLICE INVESTIGATED (1,2,9)* 1

[redacted] COUNTY SHERIFF'S DEPT.

City 1440 County 102

GENERAL LOCALITY 4
(1) Freeway, Limited Access
(2) Urban (City)
(3) Urban-Rural (mixed)
(4) Rural, Fields

CONFIGURATION (First Harm) 2
0) Struck Object or Pedestrian
1) Rear-End
(2) Head-On
3) Rear-to-Rear
4) Angle
(5) Sideswipe-Same Direction
(6) Sideswipe-Opposite Direct.
(7) NonColl:eg Fell from Veh
(8) NonImpact Deployment
(9) Unknown

FIRE INVOLVED (0) None 0
(1) AirBag Vehicle
(2) Other Vehicle
(3) Both Vehicles
(9) Unknown

NUMBER: VEHICLES INVOLVED 2
(8)=8 or more
PERSONS INVOLVED 5

INJURED PERSONS 5

MAXIMUM AIS IN ACCIDENT 6

OTHER VEHICLE: MAXIMUM AIS 6

PRIME/DEPLOY IMPACT w AB VEH: EVENT NUMBER 1

CDC 01-FDEW-4

TOTAL DELTA-V 35.0mph 35

Model Year, Make, Model, Body Type:

1980 MERCURY ZEPHYR

* (1)=Yes, (2)=No, (9)=Unknown

AIRBAG VEHICLE INSPECTION

DATE VEH. INSPECTED [redacted]/91

REASON VEHICLE NOT INSPECTED 1

(0) Not Required
(1) Inspection Completed
(2) Cannot be Located**
(3) Repaired or Destroyed**
(5) Refual or Impounded**
(7) Other*
**Specify: _____

IMPACT DATA OBTAINED 7

(0) No Data Obtained
(1) CDC Only
(2) Crush Profile Only
(3) Trajectory Data Only
(4) CDC and Crush Profile
(5) CDC and Trajectory
(6) Crush and Trajectory
(7) CDC, Crush & Trajectory

BASIS OF DELTA-V 2

(0) Not Computed (Unknown Why)
(1) CRASH - Damage Only
(2) CRASH - Damage+Trajectory
(3) Missing Vehicle Algorithm
(4) Yielding Object Algorithm
(5) Unknown Basis
(6) One Vehicle Beyond Scope
(7) Collision Beyond Scope
(8) Insufficient Data

VEHICLE HISTORY

HAS AIRBAG VEHICLE BEEN IN ANY PRIOR IMPACTS (1,2,9)* 2

HAS ANY PRIOR MAINTENANCE/SERVICE BEEN PERFORMED ON SYSTEM(1,2,9)* 2

*Describe: _____

AIRBAG VEHICLE: FLEET PLYMOUTH ACCLAIM

VIN 1P3XA46[redacted]

MILEAGE 685

DRAFT - [redacted]/85

SYSTEM READINESS LAMP
In Instrument Cluster)

PRE-IMPACT LAMP CONDITION

(1) Functioning/ProvedOut
(2) Inoperative
(9) Unknown

1

DRIVER'S REPORT OF
PRE-IMPACT FLASHING

(00) No Flashing Reported
(01) Continuous Flashing
(02)
-- >Number of Flashes
(11)
(12) Constant Light
(19) Flashing, Unkn Number
(88) Not App (system removed)
(99) Unknown

00

F RIOD OF PRE-IMPACT FLASHING

(0) No Flashing
(1) Same Day as Impact
(2) Prior Day
(3) Prior Two Days
(4) Prior Week
(5) Prior Month
(6) Over One Month
(9) Unknown

0

POST-IMPACT LAMP CONDITION

(1) Functioning/ProvedOut
(2) Inoperative
(9) Unknown

1

POST-IMPACT FLASHING

00) No Flashing
(01) Continuous Flashing
02)
-- >Number of Flashes
(11)
(12) Constant Light
19) Flashing, Unkn Number
(88) Not Appl (removed)
(99) Unknown

12

AIRBAG VEHICLE
FIRST HARMFUL EVENT

13

(01) Fire or explosion
(02) Immersion
(03) Gas Inhalation
(04) Fell from vehicle
(05) Injured in vehicle
(06) Other noncollision (specify):
(07) Overturn
(08) Jackknife with intraunit damage
Collision With:
(09) Pedestrian
(10) Pedalcyclist
(11) Railway train
(12) Animal
(13) Motor vehicle in transport (same roadway)
(14) Motor vehicle in transport (other roadway)
(15) Parked motor vehicle
(16) Other type nonmotorist (specify):
(17) Thrown or falling object
(18) Boulder
Collision with Fixed Object:
(20) Building
(21) Impact attenuator/Crash Cushion
(22) Bridge pier or abutment
(23) Bridge parapet end
(24) Bridge rail
(25) Guardrail
(26) Concrete traffic barrier
(27) Median barrier
(28) Other longitudinal barrier (specify):
(29) Highway/Traffic sign post
(30) Overhead sign support
(31) Luminaire/Light support
(32) Utility pole
(33) Other post, pole, or support (specify):
(34) Culvert
(35) Curb
(36) Ditch
(37) Embankment-earth
(38) Embankment-rock, stone or concrete
(39) Fence (wooden, wire, chain link, etc.)
(40) Wall (stone, rock, metal, etc.)
(41) Fire hydrant
(42) Shrubbery
(43) Tree
(44) Other fixed object (specify):
(45) Pavement surface irregularity (pothole, grooved, grates)
(99) Unknown

## AIRBAG VEHICLE IMPACT SUMMARY

V HICLE ROLE: 3

(0) Non-collision
( ) Striking Unit
(_) Struck Unit
(3) Both Striking and Struck
( ) Unknown

MANNER OF LEAVING SCENE: 2

( ) Driven
(2) Towed-due to damage
(3) Towed - not for damage
( ) Towed - details unknown
(_) Abandoned
(9) Unknown

N MBER OF IMPACT EVENTS: 1
(8) 8 or more, (9) Unknown

R LLOVER: 0
(0) No Rollover
(1) First Event
(2) Subsequent Event
(3) Yes, Unknown Event
(9) Unknown

O ERRIDE/UNDERRIDE: 0

(1) No over/underride
(1) Override - 1st CDC
( ) - Other CDC
(4) Underride - 1st CDC
(6) - Other CDC
( ) Unknown

## AIRBAG VEHICLE DAMAGE

CODES: (1) Yes, DAMAGED
(2) No Damage
(9) Unknown

LEFT FRONT FENDER DAMAGE: 1

R GHT FRONT FENDER DAMAGE: 1

CENTER TOP OF GRILLE DAMAGE: 1

FRONT BUMPER E.A. STATUS: Left: 4

( ) Normal Right: 4
(2) Extended
(3) Partial Compression
( ) Complete Compression
(_) Not Applicable
(9) Unknown

## FIRST AIRBAG VEHICLE IMPACT:

CONFIGURATION: 2

(0) Struck Object or Pedestrian
(1) Rear-End
(2) Head-On
(3) Rear-to-Rear
(4) Angle
(5) Sideswipe - Same Direction
(6) Sideswipe-Opposite Direct.
(7) NonColl:eg Fell from Veh
(8) Nonimpact Deployment
(9) Unknown

CDC 1 1 - F D E W - 3

OBJECT CONTACTED: 80 MERC ZEPHYR

## PRIMARY/DEPLOYMENT IMPACT:

EVENT NUMBER: 1

TOTAL DELTA-V 38.9: 39

LONGITUDINAL DELTA-V -38.3: 038

CONFIGURATION: 2

(0) Struck Object or Pedestrian
(1) Rear-End
(2) Head-On
(3) Rear-to-Rear
(4) Angle
(5) Sideswipe - Same Direction
(6) Sideswipe-Opposite Direct.
(7) NonColl:eg Fell from Veh
(8) Nonimpact Deployment
(9) Unkonwn

CDC 1 1 - F D E W - 3

OBJECT CONTACTED: 80 MERC ZEPHYR

NOTES:

**AIRBAG SYSTEM DAMAGE**

CODES: (1) Yes, Damaged*
(2) No, Intact
(8) Not App.(Removed)
(9) Unknown

| | |
|---|---|
| AIRBAG MODULE | 2 |
| SENSORS: Left Front | 9 |
| Center Front | 8 |
| Right Front | 9 |
| Rear, Cowl | 8 |
| DIAGNOSTIC MODULE | 2 |
| WIRING | 2 |
| KNEE DIVERTER | 1 |
| INDICATION OF DISCONNECTED OR LOOSE ELECTRICAL CONNECTORS | 2 |

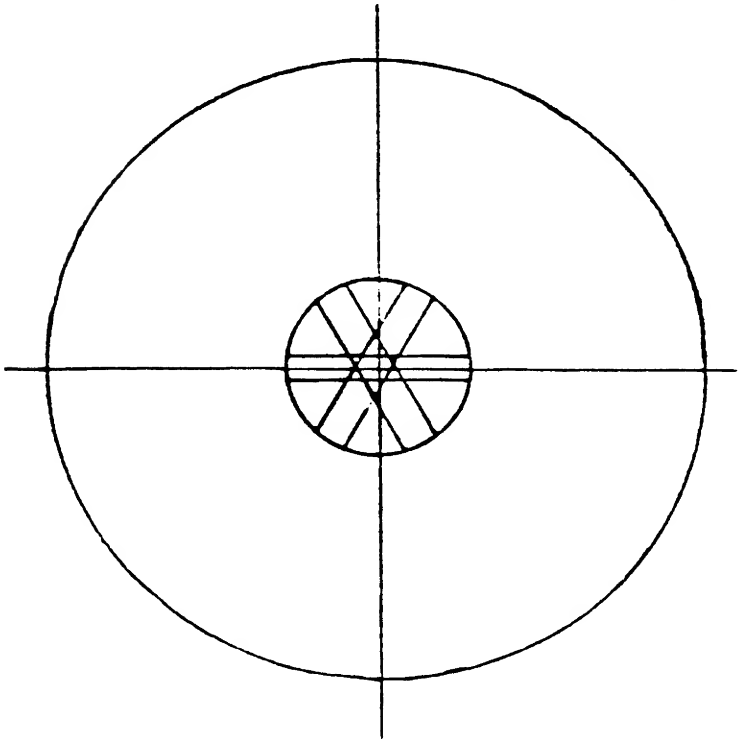
**CONDITION OF DEPLOYED BAG** 1

(1) Bag Intact
(2) Split or Torn*
(3) Cut by Object In Impact*
(4) Cut after Accident*
(5) Other (e.g., burned)*
(8) N/A (not deployed)
(9) Unknown

*DESCRIBE System and Bag Damage:

NOTE DAMAGE AND CONTACT MARKS ON AIRBAG DIAGRAMS BELOW:

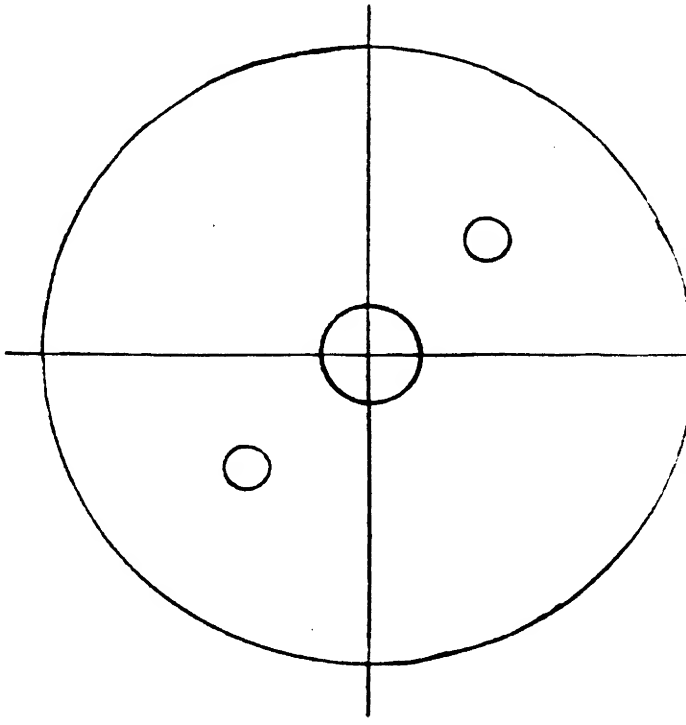
NO CONTACT EVIDENCE ON AIR BAG



FRONT

TOP

BOTTOM



BACK

CCUPANTS of AIRBAG CAR

| | |
|---|---|
| NUMBER OF OCCUPANTS IN VEHICLE (8) 8 or more | 1 |
| N MBER OF INJURED PERSONS | 1 |
| MAXIMUM AIS IN AIRBAG VEHICLE | 3 |

0) No Injury
(1-6) AIS Severity
(7) Injured, Unknown Severity
9) Unknown

D IVER AGE 49 SEX MALE

| | |
|---|---|
| NUMBER OF DRIVER INJURIES | 8 |
| S URCE OF BEST INJURY DATA | 7 |

(0) Not Injured
(1) Autopsy w/wo med. records
(2) Hospital Medical Records
(3) Emergency Room only
(4) Private physician, Clinic
(5) Lay Coroner Report
(6) EMS Personnel
(7) Interviewee
(8) Police
(9) Unknown

M XIMUM AIS BY BODY REGION

| REGION | MAX AIS | CONTACT |
|---|---|---|
| H ad/Neck/Face | 1 | 4 5 |
| Chest | 3 | 4 1/0 6 |
| Abdomen | | -- - |
| L g/Hips | 2 | 1 3/0 9 |
| Other (Arms) | 2 | 0 9/1 0 |
| D IVER MAXIMUM | 3 | 4 1/0 6 |

E JECTION: Extent NONE

Portal N/A

NOTES:

**DRIVER BELT USAGE:** (1) Used (2) Not Used (9) Unknown 1

Evidence: D-RING TRANSFER ON BELT WEBBING, ABRASIONS ON PLASTIC GUARD OVER RECLINE ASSEMBLY

**DRIVER POSTURE:** Any Comments Recorded (1) Yes, (2) No 1

Describe driver's posture and position on seat including specific comments on head, torso, buttocks, legs and feet. Also note hand and arm position. Did driver brace before crash? Describe:

NORMAL UPRIGHT POSITION, BOTH HANDS BRACING AGAINST STEERING WHEEL, RIGHT FOOT FIRMLY AGAINST BRAKE PEDAL

**DRIVER FOREIGN OBJECTS:** Comments Recorded (1) Yes, (2) No 1

Was driver wearing contact lenses or eyeglasses? Or holding any foreign object at the time of the impact (packages on lap, pipe, food, bottle, cigarette, etc.)? Did any lenses, objects, or jewelry play any role?:

PRESCRIPTION EYEGLASSES SEPARATED FROM FACE, LENS POPPED OUT OF FRAMES

**DRIVER COMMENTS:** Comments Recorded (1) Yes, (2) No 1

Was the driver aware that the vehicle was equipped with a supplemental restraint system? Did driver offer any comments on smoke, noise, etc.? Did the driver comment on the airbag as a restraint system? Describe:

DRIVER SAW SILVER OR GRAY OBJECT, THEN IT DISAPPEARED. HE THOUGHT IT WAS THE AIR BAG.

**PASSENGER-AIRBAG CONTACT** (1) Yes, (2) No, (9) Unknown 2

Describe: NO PASSENGER

[redacted]/85

# APPENDIX D

NASS Vehicle Forms

US Department of Transportation
National Highway Traffic Safety Administration

# GENERAL VEHICLE FORM

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. ~~Primary Sampling Unit Number~~ ____

2. Case Number ~~Stratum~~ 91-14

3. Vehicle Number 01

## VEHICLE IDENTIFICATION

4. Vehicle Model Year 92
Code the last two digits of the model year
(99) Unknown

5. Vehicle Make (specify): 09
PLYMOUTH
Applicable codes are found in your NASS CDS Data Collection, Coding, and Editing Manual.
(99) Unknown

6. Vehicle Model (specify): 019
ACCLAIM
Applicable codes are found in your NASS CDS Data Collection, Coding, and Editing Manual.
(999) Unknown

7. Body Type 04
Note: Applicable codes are found on the back of this page.

8. Vehicle Identification Number
1P3XA46K2NF[redacted]
Left justify; Slash zeros and letter Z (Ø and Ƶ)
No VIN—Code all zeros
Unknown—Code all nine's

## OFFICIAL RECORDS

9. Police Reported Vehicle Disposition 1
(0) Not towed due to vehicle damage
(1) Towed due to vehicle damage
(9) Unknown

10. Police Reported Travel Speed 58
Code to the nearest mph (NOTE: 00 means less than 0.5 mph)
(97) 96.5 mph and above 55-60
(99) Unknown

11. Police Reported Alcohol Presence 0
(0) No alcohol present
(1) Yes (alcohol present)
(7) Not reported
(8) No driver present
(9) Unknown

Note: See variables 37 through 55 (Page 4) for Information on Other Drugs

12. Alcohol Test Result for Driver 96
Code actual value (decimal implied before first digit—0.xx)
(95) Test refused
(96) None given
(97) AC test performed, results unknown
(98) No driver present
(99) Unknown

Source ____

## ACCIDENT RELATED

13. Speed Limit 55
(00) No statutory limit
Code posted or statutory speed limit
(99) Unknown

14. Attempted Avoidance Maneuver 03
(00) No impact
(01) No avoidance actions
(02) Braking (no lockup)
(03) Braking (lockup)
(04) Braking (lockup unknown)
(05) Releasing brakes
(06) Steering left
(07) Steering right
(08) Braking and steering left
(09) Braking and steering right
(10) Accelerating
(11) Accelerating and steering left
(12) Accelerating and steering right
(97) No driver present
(98) Other action (specify):
____
(99) Unknown

15. Accident Type 51
Applicable codes may be found on the back of page two of this field form
(00) No impact
Code the number of the diagram that best describes the accident circumstance
(98) Other accident type (specify):
____
(99) Unknown

****** SKIP TO VARIABLE GV37 IF GV07 DOES NOT EQUAL 01-49 ******

HS Form 435 (Rev. 1/91)

F-435 —M 34c

# CODES FOR BODY TYPE

## CDS APPLICABLE VEHICLES

Automobiles
- (01) Convertible (excludes sun-roof, t-bar)
- (02) 2-door sedan, hardtop, coupe
- (03) 3-door/2-door hatchback
- (04) 4-door sedan, hardtop
- (05) 5-door/4-door hatchback
- (06) Station wagon (excluding van and truck based)
- (08) Other automobile type (specify):

_____

- (09) Unknown automobile type

Automobile Derivatives
- (10) Auto based pickup (includes El Camino, Caballero, Ranchero, and Brat)
- (11) Auto based panel (cargo station wagon, includes auto based ambulance/hearse)
- (12) Large limousine—more than four side doors or stretched chassis

Utility Vehicles
- (13) Short utility—not truck based (includes Jeep CJ-5, Jeep CJ-7, Renegade, Landrover, Pre-78 Bronco, Landcruiser, Thing)
- (14) Truck based utility (2-door; includes Blazer, Bronco—78 on, Bronco II, Jimmy, Ramcharger, Cherokee, Trailduster, Scout)

Van Based Light Trucks (≤ 10,000 lbs GVWR)
- (20) Minivan (Lumina APV, Astro, Caravan, Plymouth Vista, Aerostar, Safari, Voyager [84 and after], Dodge Vista, Mini Ram Van, Toyota Cargo Van, Toyota Van, Vanagon, VW Bus, Kombi)
- (21) Standard van (Sportvan, Chevy Van, Club Wagon, Ford Econoline, Ram Van, Chateau, Ram Wagon, Vandura, Rally, Voyager [83 and before], Beauville, Sportsman)
- (28) Other van type (Hi-Cube Van, Kary) (specify):

_____

- (29) Unknown van type

Light Conventional Trucks (Pickup Style Cab, ≤ 10,000 lbs GVWR)
- (30) Compact pickup (<4,500 lbs. GVWR, S-10, LUV, Ram 50, Rampage, Courier, Ranger, S-15 Pup, Mazda Pickup, Mitsubishi Truck, Nissan Pickup, Arrow Pickup, Scamp, Toyota Pickup, VW Pickup)
- (31) Standard pickup (4,500 to 10,000 lbs. GVWR, C10 - C30, K10 - K30, T10, D100 - D350, W150 - W350, F100 - F350, Comanche, J10 - J30, Dakota)
- (32) Pickup with slide-in camper
- (33) Truck based station wagon (4-door; includes Suburban, Travelall, Wagoneer)
- (34) Light truck based suburban limousine
- (35) Convertible pickup
- (39) Unknown (pickup style) light conventional truck type

Other Light Trucks (≤ 10,000 lbs GVWR)
- (40) Cab chassis based (includes rescue vehicle, light stake, dump, and tow truck)
- (41) Truck based panel
- (42) Light truck based motorhome (chassis mounted)
- (47) Other light conventional truck type (not a pickup—includes step vans ≤ 10,000 lbs GVWR, Grumman LLV vehicle) (specify):

_____

- (48) Unknown other light truck type (not a pickup)
- (49) Unknown light vehicle type (automobile, van, or light truck)

## OTHER VEHICLES

Buses (Excludes Van Based)
- (50) School bus (designed to carry students, not cross country or transit)
- (58) Other bus type (e.g., transit, intercity, bus based motorhome) (specify):

_____

- (59) Unknown bus type

Medium/Heavy Trucks (>10,000 lbs GVWR)
- (60) Step van
- (61) Single unit straight truck (10,000 lbs < GVWR ≤ 26,000 lbs)
- (62) Single unit straight truck (>26,000 lbs GVWR)
- (63) Medium/heavy truck based motorhome
- (64) Truck-tractor with no cargo trailer
- (65) Truck-tractor pulling one trailer
- (66) Truck-tractor pulling two or more trailers
- (67) Truck-tractor (unknown if pulling trailer)
- (68) Unknown medium/heavy truck type
- (69) Unknown truck type (light/medium/heavy)

Motored Cycles (Does Not Include All-Terrain Vehicles/Cycles)
- (70) Motorcycle
- (71) Moped (motorized bicycle)
- (78) Other motored cycle type(minibike, motorscooter) (specify):

_____

- (79) Unknown motored cycle type

Other Vehicles
- (80) ATV (All-Terrain Vehicle) and ATC (All-Terrain Cycle)
- (88) Other vehicle type (specify):

_____

- (99) Unknown body type

## OCCUPANT RELATED

16. Driver Presence in Vehicle: 1
(0) Driver not present
(1) Driver present
(9) Unknown

17. Number of Occupants This Vehicle: 01
(00-96) Code actual number of occupants for this vehicle
(97) 97 or more
(99) Unknown

18. Number of Occupant Forms Submitted: 01

## VEHICLE WEIGHT ITEMS

19. Vehicle Curb Weight: 02,800
2794 Code weight to nearest 100 pounds.
(010) Less than 1050 pounds
(135) 13,500 lbs or more
(999) Unknown

Source: MVMA SPECS

20. Vehicle Cargo Weight: 0,000
NONE Code weight to nearest 100 pounds.
(00) Less than 50 pounds
(97) 9,650 lbs or more
(99) Unknown

## RECONSTRUCTION DATA

21. Towed Trailing Unit: 0
(0) No towed unit
(1) Yes – towed trailing unit
(9) Unknown

22. Documentation of Trajectory Data for This Vehicle: 1
(0) No
(1) Yes

23. Post Collision Condition of Tree or Pole (for Highest Delta V): 0
(0) Not collision (for highest delta V) with tree or pole
(1) Not damaged
(2) Cracked/sheared
(3) Tilted <45 degrees
(4) Tilted ≥45 degrees
(5) Uprooted tree
(6) Separated pole from base
(7) Pole replaced
(8) Other (specify): _____
(9) Unknown

24. Rollover: 0
(0) No rollover (no overturning)

Rollover (primarily about the longitudinal axis)
(1) Rollover, 1 quarter turn only
(2) Rollover, 2 quarter turns
(3) Rollover, 3 quarter turns
(4) Rollover, 4 or more quarter turns (specify): _____

(5) Rollover – end-over-end (i.e., primarily about the lateral axis)
(9) Rollover (overturn), details unknown

## OVERRIDE/UNDERRIDE (THIS VEHICLE)

25. Front Override/Underride (this vehicle): 0

26. Rear Override/Underride (this vehicle): 0

(0) No override/underride, or not an end-to-end impact

Override (see specific CDC)
(1) 1st CDC
(2) 2nd CDC
(3) Other not automated CDC (specify): _____

Underride (see specific CDC)
(4) 1st CDC
(5) 2nd CDC
(6) Other not automated CDC (specify): _____

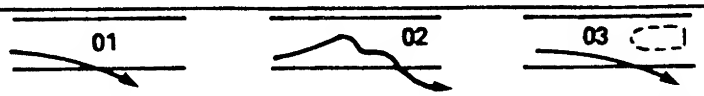
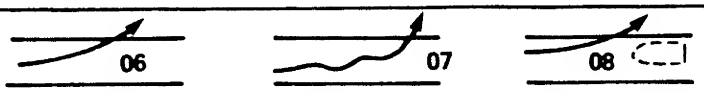
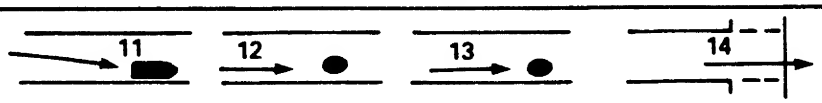
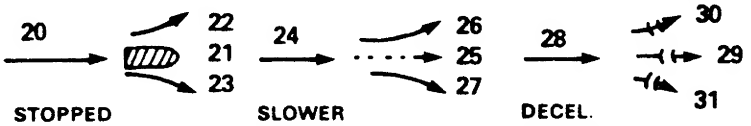
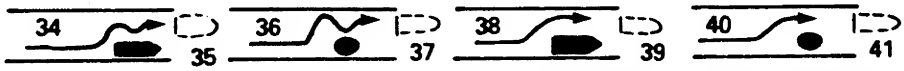
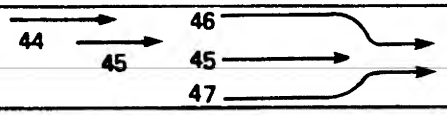
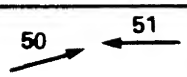
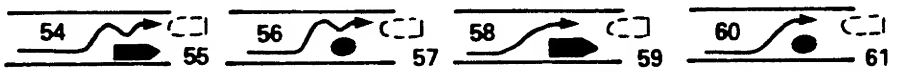
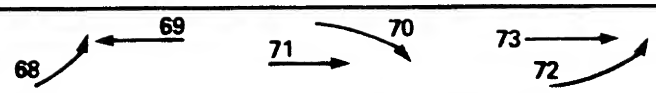
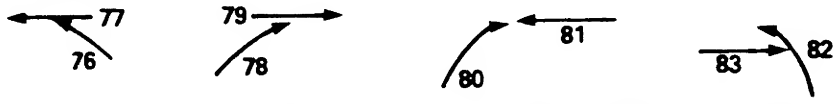
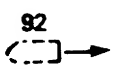
(7) Medium/heavy truck or bus override
(9) Unknown

## HEADING ANGLE AT IMPACT FOR HIGHEST DELTA V

Values: (000)-(359) Code actual value
(997) Noncollision
(998) Impact with object
(999) Unknown

27. Heading Angle for This Vehicle: 008

28. Heading Angle for Other Vehicle: 160

| Category | Configuration | ACCIDENT TYPES (Includes Intent) |
|---|---|---|
| I. Single Driver | A. Right Roadside Departure |   |
| | B. Left Roadside Departure |   |
| | C. Forward Impact |   |
| II. Same Trafficway Same Direction | D Rear-End |   |
| | E Forward Impact |   |
| | F. Sideswipe Angle |   |
| III. Same Trafficway Opposite Direction | G. Head-On |   |
| | H Forward Impact |   |
| | I. Sideswipe/ Angle |   |
| IV. Change Trafficway Vehicle Turning | J. Turn Across Path |   |
| | K. Turn Into Path |   |
| V. Intersecting Paths (Vehicle Damage) | L. Straight Paths |   |
| VI. Miscellaneous | M. Backing Etc. |   98 Other Accident Type 99 Unknown Accident Type 00 No Impact |

29. Basis for Total Delta V (Highest) 2

Delta V Calculated
(1) CRASH program—damage only routine
(2) CRASH program—damage and trajectory routine
(3) Missing vehicle algorithm

Delta V Not Calculated
(4) At least one vehicle (which may be this vehicle) is beyond the scope of an acceptable reconstruction program, regardless of collision conditions.

(5) All vehicles within scope (CDC applicable) of CRASH program but one of the collision conditions is beyond the scope of the CRASH program or other acceptable reconstruction techniques, regardless of adequacy of damage data.

(6) All vehicles and collision conditions are within scope of one of the acceptable reconstruction programs, but there is insufficient data available.

## COMPUTER GENERATED DELTA V

| | Secondary | Highest |
|---|---|---|
| 30. Total Delta V | | 39 |
| 38.9 Nearest mph | — | |

(NOTE: 00 means less than 0.5 mph)
(97) 96.5 mph and above
(99) Unknown

| | Secondary | Highest |
|---|---|---|
| 31. Longitudinal Component of Delta V | | ⊖ 38 |
| ⊖38.3 Nearest mph | — | |

(NOTE: __00 means greater than −0.5 and less than +0.5 mph)
(±97) ±96.5 mph and above
(__ 99) Unknown

| | Secondary | Highest |
|---|---|---|
| 32. Lateral Component of Delta V | | ⊕ 07 |
| 6.65 Nearest mph | — | |

(NOTE: __00 means greater than −0.5 and less than +0.5 mph)
(±97) ±96.5 mph and above
(__ 99) Unknown

33. Energy Absorption 136,500

136544.7 Nearest 100 foot-lbs —

(NOTE: 0000 means less than 50 Foot-Lbs)
(9997) 999,650 foot-lbs or more
(9999) Unknown

34. Confidence in Reconstruction Program Results (for Highest Delta V) 1
(0) No reconstruction
(1) Collision fits model—results appear reasonable
(2) Collision fits model—results appear high
(3) Collision fits model—results appear low
(4) Borderline reconstruction—results appear reasonable

35. Type of Vehicle Inspection 1
(0) No Inspection
(1) Complete inspection
(2) Partial inspection (specify): _____

36. Is this an AOPS Vehicle? 1
(0) No
(1) Yes

**IS OLDMISS APPLICABLE FOR THIS VEHICLE? [ ] YES [✓] NO**
**IF YES: IS A COMPLETED OLDMISS PROGRAM SUMMARY INCLUDED? [ ] YES [ ] NO**

37. Police Reported Other Drug Presence 0
    (0) No other drugs present
    (1) Yes (other drug present)
    (7) Not reported
    (8) No driver present
    (9) Unknown

38. Police Reported Observation/Perception Test Type For Driver 0
    (0) No observation/perception test given
    (1) Drug recognition technician (DRT) determination
    (2) Behavioral
    (3) Other physical observation/perception determination (specify):

    _____

    (7) Other observation/perception test
    (8) No driver present

    _____

    (9) Unknown if observation/perception test given

39. Other Drug Specimen Test Type For Driver 0
    (0) No specimen test given
    (1) Blood test
    (2) Urine test
    (3) Other specimen tests (specify):

    _____

    (7) Unspecified specimen test
    (8) No driver present
    (9) Unknown if specimen test given

## OTHER DRUGS TEST RESULTS FOR DRIVER

| | Observation/ Perception Test Results | Specimen Test Results |
|---|---|---|
| Narcotic Drug | 40. 0 | 41. 0 |
| Depressant Drug | 42. 0 | 43. 0 |
| Stimulant Drug | 44. 0 | 45. 0 |
| Hallucinogen Drug | 46. 0 | 47. 0 |
| Cannabinoid Drug | 48. 0 | 49. 0 |
| Phencyclidine (PCP)Drug | 50. 0 | 51. 0 |
| Inhalant Drug | 52. 0 | 53. 0 |
| Other Drug (Excluding Nicotine, Aspirin, Alcohol, Drugs Administered Post-Crash) | 54. 0 | 55. 0 |

Codes For Observation/Perception Test Results

(0) No observation/perception test given
(1) Passed observation/perception test
(2) Failed observation/perception test
(3) Observation/perception test given—results unknown
(8) No driver present
(9) Unknown if observation/perception test given

Codes for Specimen Test Results

(0) No specimen test given
(1) Drug not found in specimen
(2) Drug found in specimen
(8) No driver present
(9) Unknown if specimen test given

*** IF THE CDS APPLICABLE VEHICLE WAS NOT INSPECTED (I.E., GV35 = 0), ***
DO NOT COMPLETE THE EXTERIOR AND INTERIOR VEHICLE FORMS

*** IF GV07 DOES NOT EQUAL 01-49, DO NOT COMPLETE ***
THE EXTERIOR VEHICLE, INTERIOR VEHICLE,
OCCUPANT ASSESSMENT, AND OCCUPANT INJURY FORMS.

U.S. Department of Transportation
National Highway Traffic Safety Administration

# EXTERIOR VEHICLE FORM

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. ~~Primary Sampling Unit Number~~ ____
2. Case Number – ~~Stratum~~ 91-14
3. Vehicle Number 01

## VEHICLE IDENTIFICATION

VIN 1P3XA46K2NF[redacted] Model Year 1992

Vehicle Make (specify): PLYMOUTH Vehicle Model (specify): ACCLAIM

## LOCATOR

Locate the end of the damage with respect to the vehicle longitudinal center line or bumper corner for end impacts or an undamaged axle for side impacts.

| Specific Impact No. | Location of Direct Damage | Location of Field L |
|---|---|---|
| 1 | FULL FRONTAL - 50.5", CORNER - | FULL FRONTAL 49.75" |
| | TO-CORNER (MEASURED PARALLEL | MEASURED PARALLEL TO |
| | TO DAMAGE PROFILE) | REFERENCE LINE |

## CRUSH PROFILE

NOTES: Identify the plane at which the C-measurements are taken (e.g., at bumper, above bumper, at sill, above sill, etc.) and label adjustments (e.g., free space).

Measure and document on the vehicle diagram the location of maximum crush.

Measure C1 to C6 from driver to passenger side in front or rear impacts and rear to front in side impacts.

Free space value is defined as the distance between the baseline and the original body contour taken at the individual C locations. This may include the following: bumper lead, bumper taper, side protrusion, side taper, etc. Record the value for each C-measurement and maximum crush.

Use as many lines/columns as necessary to describe each damage profile.

| Specific Impact Number | Plane of C-Measurements | Direct Damage | | Field L | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ | $C_6$ | ±D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Width (CDC) | Max Crush | | | | | | | | |
| 1 | FRONT BUMPER | 50.5" | 32.125 | 49.75 | 30.25 | 31.5 | 31.25 | 28.25 | 25.25 | 22.625 | 0 |
| | FREE-SPACE | | 0.125 | | 5.75" | 2.0 | 0.25 | 0.25 | 1.6 | 5.75 | |
| 1 | RESIDUAL CRUSH | 50.5 | 32.0" | 49.75 | 24.5" | 29.5" | 31.0" | 28.0" | 23.625" | 16.875" | 0 |

## VEHICLE DAMAGE SKETCH

**TIRE – WHEEL DAMAGE**

| | a. Rotation physically restricted | b. Tire deflated |
|---|---|---|
| RF | 1 | 2 |
| LF | 2 | 2 |
| RR | 2 | 2 |
| LR | 2 | 2 |

(1) Yes (2) No (8) NA (9) Unk.

**TYPE OF TRANSMISSION**

☐ Manual ☒ 3-SPEED Automatic

**ORIGINAL SPECIFICATIONS**

| | |
|---|---|
| Wheelbase | 103.3" |
| Overall Length | 181.2" |
| Maximum Width | 68.1" |
| Curb Weight | 2794 |
| Average Track | 57.4 |
| Front Overhang | |
| Rear Overhang | |
| Engine Size: cyl./ displ. | 4 cyl. 2.5L |
| Undeformed End Width | 62.0" |

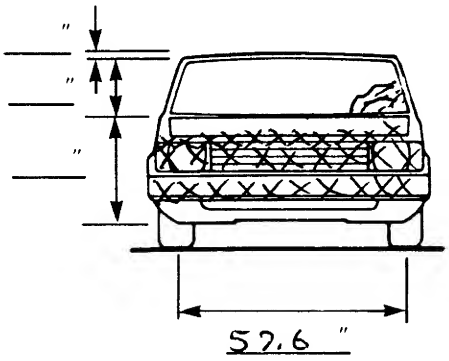
**WHEEL STEER ANGLES**
(For locked front wheels or displaced rear axles only)

RF ± ___ ___ °
LF ± ___ ___ °
RR ± ___ ___ °
LR ± ___ ___ °
Within ±5 degrees

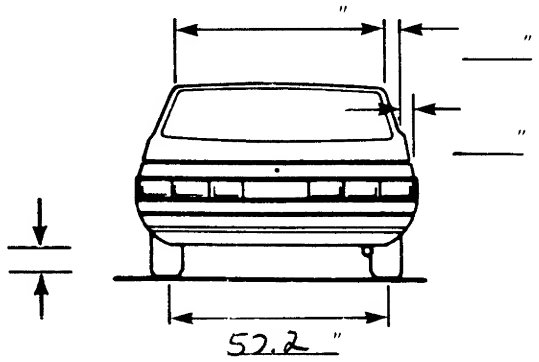
**DRIVE WHEELS**

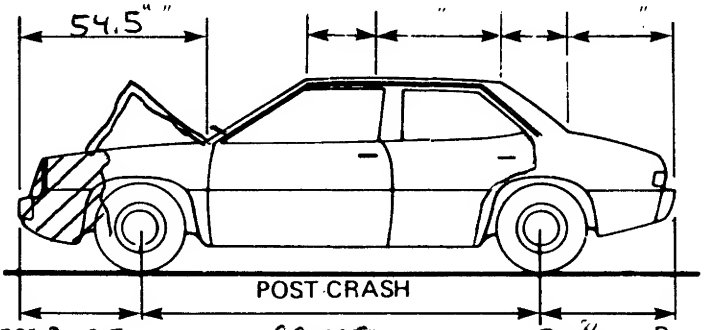
☒ FWD ☐ RWD ☐ 4WD

Approximate Cargo Weight N/A

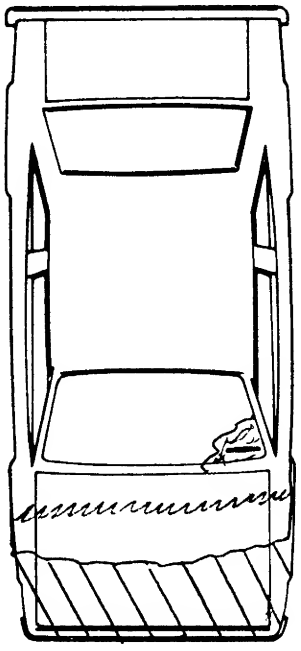



Original Bumper height



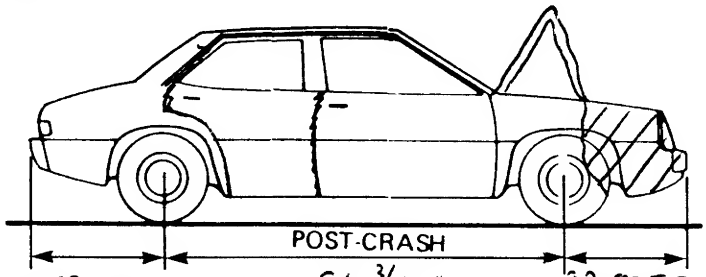




Bumper corner 13.125" 98.625" 38 3/16 " Bumper corner
Stringline 43.325" 39.0 " Stringline



LAMINATE TEAR FROM REAR EDGE OF HOOD

BOTH RIGHT SIDE DOORS JAMMED SHUT




Bumper corner 39.125 " 96 3/16 " 22.875 Bumper corner
Stringline 39 15/16 " 45.5 " Stringline

NOTES Sketch new perimeter and cross hatch direct damage and single hatch induced damage on all views. Annotate observations which might be useful in reconstructing the accident (e.g., grass in tire bead, direction of striations, scuff on sidewall, etc.). If pulling trailer, sketch type of trailer and damage received on the back of this page.
Annotate any damage caused by extrication such as component removal by torching, prying, or hydraulic shears.

## CDC WORKSHEET

### CODES FOR OBJECT CONTACTED

01-30—Vehicle Number

Noncollision
- (31) Overturn—rollover
- (32) Fire or explosion
- (33) Jackknife
- (34) Other intraunit damage (specify): _____
- (35) Noncollision injury
- (38) Other noncollision (specify): _____
- (39) Noncollision—details unknown

Collision with Fixed Object
- (41) Tree (≤4 inches in diameter)
- (42) Tree (>4 inches in diameter)
- (43) Shrubbery or bush
- (44) Embankment
- (45) Breakaway pole or post (any diameter)

Nonbreakaway Pole or Post
- (50) Pole or post (≤4 inches in diameter)
- (51) Pole or post (>4 but ≤12 inches in diameter)
- (52) Pole or post (>12 inches in diameter)
- (53) Pole or post (diameter unknown)
- (54) Concrete traffic barrier
- (55) Impact attenuator
- (56) Other traffic barrier (specify): _____
- (57) Fence
- (58) Wall
- (59) Building
- (60) Ditch or Culvert
- (61) Ground
- (62) Fire hydrant
- (63) Curb
- (64) Bridge
- (68) Other fixed object (specify): _____
- (69) Unknown fixed object

Collision With Nonfixed Object
- (71) Motor vehicle not in transport
- (72) Pedestrian
- (73) Cyclist or cycle
- (74) Other nonmotorist or conveyance (specify): _____
- (75) Vehicle occupant
- (76) Animal
- (77) Train
- (78) Trailer, disconnected in transport
- (88) Other nonfixed object (specify): _____
- (89) Unknown nonfixed object
- (98) Other event (specify): _____
- (99) Unknown event or object

### DEFORMATION CLASSIFICATION BY EVENT NUMBER

| Accident Event Sequence Number | Object Contacted | (1) (2) Direction of Force (degrees) | Incremental Value of Shift | (3) Deformation Location | (4) Specific Longitudinal or Lateral Location | (5) Specific Vertical or Lateral Location | (6) Type of Damage Distribution | (7) Deformation Extent |
|---|---|---|---|---|---|---|---|---|
| 01 | 02 | -015 | 00 | F | D | E | W | 03 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

## COLLISION DEFORMATION CLASSIFICATION

HIGHEST DELTA "V"

| Accident Event Sequence Number | Object Contacted | (1) (2) Direction of Force | (3) Deformation Location | (4) Specific Longitudinal or Lateral Location | (5) Specific Vertical or Lateral Location | (6) Type of Damage Distribution | (7) Deformation Extent |
|---|---|---|---|---|---|---|---|
| 4. 01 | 5. 02 | 6. 11 | 7. F | 8. D | 9. E | 10. W | 11. 03 |

Second Highest Delta "V"

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. |

## CRUSH PROFILE

(The crush profile for the damage described in the CDC(s) above should be documented in the appropriate space below. ALL MEASUREMENTS ARE IN INCHES.)

HIGHEST DELTA "V"

| 20. L | 21. C1 | C2 | C3 | C4 | C5 | C6 | 22. + – D |
|---|---|---|---|---|---|---|---|
| 050 | 25 | 30 | 31 | 28 | 24 | 17 | + – 000 |

Second Highest Delta "V"

| 23. L | 24. C1 | C2 | C3 | C4 | C5 | C6 | 25. + – D |
|---|---|---|---|---|---|---|---|
| | | | | | | | + – |

26. Are CDCs Documented but Not Coded on The Automated File? 0
(0) No
(1) Yes

27. Researcher's Assessment of Vehicle Disposition 1
(0) Not towed due to vehicle damage
(1) Towed due to vehicle damage
(9) Unknown

28. Original Wheelbase 103.3
_____Code to the nearest tenth of an inch
(9999) Unknown

29. Is This A Multi-Stage Manufactured Vehicle And/Or A Certified Altered Vehicle? 0
(0) No post manufacturer modifications
(1) Yes - post manufacturer modifications (specify): _____
_____
_____
(Include photograph of CERTIFICATION PLACARD in case report)
(9) Unknown if vehicle is modified

30. Fire Occurrence 0
(0) No fire

Yes, fire occurred
(1) Minor
(2) Major
(9) Unknown

31. Origin of Fire 0
(0) No fire
(1) Vehicle exterior (front, side, back, top)
(2) Exhaust system
(3) Fuel tank (and other fuel retention system parts)
(4) Engine compartment
(5) Cargo/trunk compartment
(6) Instrument panel
(7) Passenger compartment area
(8) Other location (specify): _____
(9) Unknown

32. Type of Fuel Tank 1
(0) No fuel tank (electrical vehicle)
(1) Metallic
(2) Non-metallic
(9) Unknown

*** STOP: IF THE CDS APPLICABLE VEHICLE WAS NOT TOWED ***
(I.E., GV09=0 OR 9), DO NOT COMPLETE THE INTERIOR VEHICLE FORM.

U.S. Department of Transportation
National Highway Traffic Safety Administration

# INTERIOR VEHICLE FORM

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. ~~Primary Sampling Unit Number~~ ____
2. Case Number ~~Stratum~~ 91-14
3. Vehicle Number 01

## INTEGRITY

**4. Passenger Compartment Integrity** 00

(00) No integrity loss

Yes, Integrity Was Lost Through
(01) Windshield
(02) Door (side)
(03) Door/hatch (back door)
(04) Roof
(05) Roof glass
(06) Side window
(07) Rear window (backlight)
(08) Roof and roof glass
(09) Windshield and door (side)
(10) Windshield and roof
(11) Side and rear window (side window and backlight)
(12) Windshield and side window
(13) Door and side window
(98) Other combination of above (specify): _____

(99) Unknown

### Door, Tailgate Or Hatch Opening

5. LF 1 6. RF 3 7. LR 1 8. RR 3 9. TG/H 0

(0) No door/gate/hatch
(1) Door/gate/hatch remained closed and operational
(2) Door/gate/hatch came open during collision
(3) Door/gate/hatch jammed shut
(8) Other (specify): _____

(9) Unknown

### Damage/Failure Associated with Door, Tailgate or Hatch Opening in Collision. If IV05-IV09 ≠ 2, Then Code 0.

10. LF 0 11. RF 0 12. LR 0 13. RR 0 14. TG/H 0

(0) No door/gate/hatch or door not opened

Door, Tailgate, or Hatch Came Open During Collision
(1) Door operational (no damage)
(2) Latch/striker failure due to damage
(3) Hinge failure due to damage
(4) Door structure failure due to damage
(5) Door support (i.e., pillar, sill, roof side rail, etc.) failure due to damage
(6) Latch/striker and hinge failure due to damage
(8) Other failure (specify): _____

(9) Unknown

## GLAZING

### Glazing Damage from Impact Forces

15. WS 2 16. LF 0 17. RF 0 18. LR 0 19. RR 0
20. BL 0 21. Roof 8 22. Other 8

(0) No glazing damage from impact forces
(2) Glazing in place and cracked from impact forces
(3) Glazing in place and holed from impact forces
(4) Glazing out-of-place (cracked or not) and not holed from impact forces
(5) Glazing out-of-place and holed from impact forces
(6) Glazing disintegrated from impact forces
(7) Glazing removed prior to accident
(8) No glazing
(9) Unknown if damaged

### Glazing Damage from Occupant Contact

23. WS 0 24. LF 0 25. RF 0 26. LR 0 27. RR 0
28. BL 0 29. Roof 0 30. Other 0

(0) No occupant contact to glazing or no glazing
(1) Glazing contacted by occupant but no glazing damage
(2) Glazing in place and cracked by occupant contact
(3) Glazing in place and holed by occupant contact
(4) Glazing out-of-place (cracked or not) by occupant contact and not holed by occupant contact
(5) Glazing out-of-place by occupant contact and holed by occupant contact
(6) Glazing disintegrated by occupant contact
(9) Unknown if contacted by occupant

If No Glazing Damage ***And*** No Occupant Contact or No Glazing, Then Code IV 31 Through IV 46 As 0

### Type of Window/Windshield Glazing

31. WS 1 32. LF 2 33. RF 2 34. LR 2 35. RR 2
36. BL 2 37. Roof 0 38. Other 0

(0) No glazing contact and no damage, or no glazing
(1) AS-1 – Laminated
(2) AS-2 – Tempered
(3) AS-3 – Tempered-tinted
(4) AS-14 – Glass/Plastic
(8) Other (specify): _____

(9) Unknown

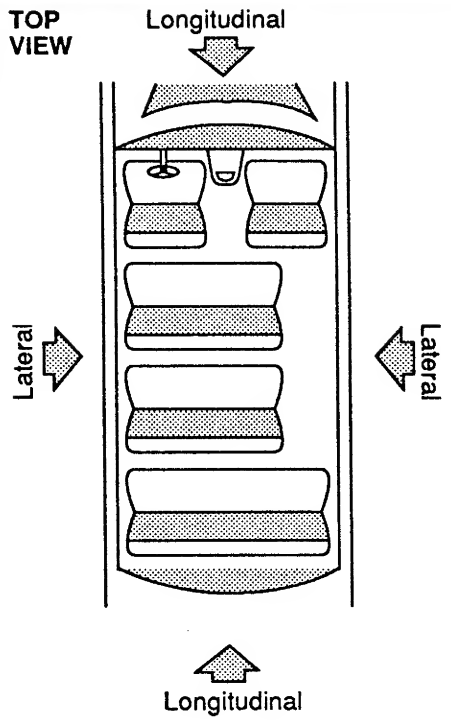
### Window Precrash Glazing Status

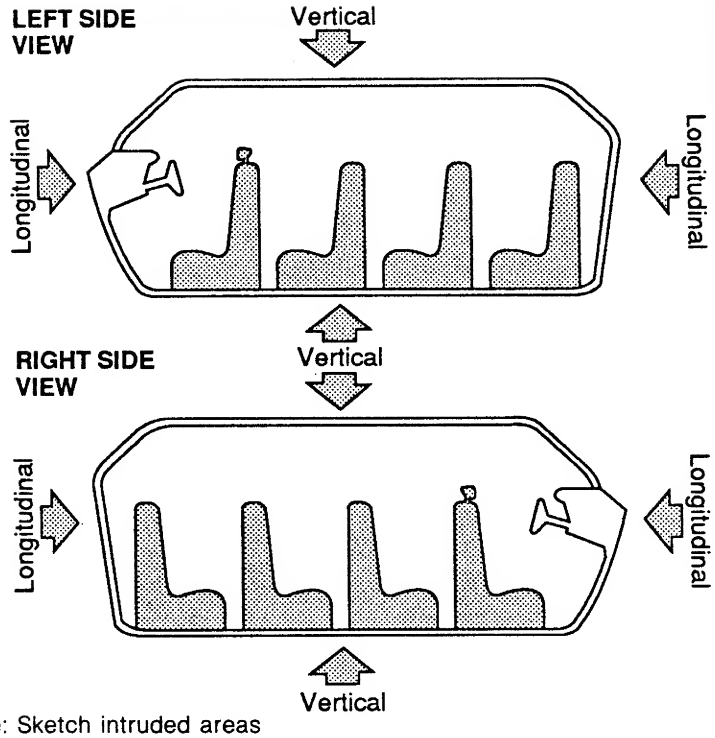
39. WS 1 40. LF 2 41. RF 2 42. LR 2 43. RR 2
44. BL 1 45. Roof 0 46. Other 0

(0) No glazing contact and no damage, or no glazing
(1) Fixed
(2) Closed
(3) Partially opened
(4) Fully opened
(9) Unknown

Form 435C (1/91)

# INTRUSION WORK SHEET




Note: Sketch intruded areas

| LOCATION OF INTRUSION | INTRUDED COMPONENT | COMPARISION VALUE | – | INTRUDED VALUE | = | INTRUSION | DOMINANT CRUSH DIRECTION |
|---|---|---|---|---|---|---|---|
| 11 | 05 | | – | | = | | 5.25" |
| 13 | 05 | | – | | = | | 2.25 |
| 11 | 02 | | – | | = | | 1.5 |
| 11 | 17 | | – | | = | | 4.0" |
| 13 | 04 | | – | | = | | 1.5 |
| | | | – | | = | | |
| | | | – | | = | | |
| | | | – | | = | | |
| | | | – | | = | | |
| | | | – | | = | | |
| | | | – | | = | | |
| | | | – | | = | | |
| | | | – | | = | | |
| | | | – | | = | | |
| | | | – | | = | | |

Document no more than the 15 most severe intrusions

# OCCUPANT AREA INTRUSION

Note: If no intrusions, leave variables IV 47-IV 86 blank.

| | Location of Intrusion | Intruding Component | Magnitude of Intrusion | Dominant Crush Direction |
|---|---|---|---|---|
| 1st | 47. 11 | 48. 05 | 49. 2 | 50. 2 |
| 2nd | 51. 11 | 52. 02 | 53. 1 | 54. 2 |
| 3rd | 55. 11 | 56. 17 | 57. 2 | 58. 1 |
| 4th | 59. 13 | 60. 04 | 61. 1 | 62. 2 |
| 5th | 63. 13 | 64. 05 | 65. 1 | 66. 2 |
| 6th | 67. ____ | 68. ____ | 69. ____ | 70. ____ |
| 7th | 71. ____ | 72. ____ | 73. ____ | 74. ____ |
| 8th | 75. ____ | 76. ____ | 77. ____ | 78. ____ |
| 9th | 79. ____ | 80. ____ | 81. ____ | 82. ____ |
| 10th | 83. ____ | 84. ____ | 85. ____ | 86. ____ |

## LOCATION OF INTRUSION

Front Seat
- (11) Left
- (12) Middle
- (13) Right

Second Seat
- (21) Left
- (22) Middle
- (23) Right

Third Seat
- (31) Left
- (32) Middle
- (33) Right

Fourth Seat
- (41) Left
- (42) Middle
- (43) Right

- (97) Catastrophic
- (98) Other enclosed area (specify): _____
- (99) Unknown

## INTRUDING COMPONENT

Interior Components
- (01) Steering assembly
- (02) Instrument panel left
- (03) Instrument panel center
- (04) Instrument panel right
- (05) Toe pan
- (06) A-pillar
- (07) B-pillar
- (08) C-pillar
- (09) D-pillar
- (10) Door panel (side)
- (12) Roof (or convertible top)
- (13) Roof side rail
- (14) Windshield
- (15) Windshield header
- (16) Window frame
- (17) Floor pan (includes sill)
- (18) Backlight header
- (19) Front seat back
- (20) Second seat back
- (21) Third seat back
- (22) Fourth seat back
- (23) Fifth seat back
- (24) Seat cushion
- (25) Back door/panel (e.g., tailgate)
- (26) Other interior component (specify): _____
- (27) Side panel - forward of the A-pillar
- (28) Side panel - rear of the A-pillar

Exterior Components
- (30) Hood
- (31) Outside surface of vehicle (specify): _____
- (32) Other exterior object in the environment (specify): _____
- (33) Unknown exterior object
- (97) Catastrophic
- (98) Intrusion of unlisted component(s) (specify): _____
- (99) Unknown

## MAGNITUDE OF INTRUSION

- (1) ≥ 1 inch but < 3 inches
- (2) ≥ 3 inches but < 6 inches
- (3) ≥ 6 inches but < 12 inches
- (4) ≥ 12 inches but < 18 inches
- (5) ≥ 18 inches but < 24 inches
- (6) ≥ 24 inches
- (7) Catastrophic
- (9) Unknown

## DOMINANT CRUSH DIRECTION

- (1) Vertical
- (2) Longitudinal
- (3) Lateral
- (7) Catastrophic
- (9) Unknown

## STEERING RIM/SPOKE DEFORMATION

| COMPARISON VALUE | - | DAMAGE VALUE | = | DEFORMATION |
|---|---|---|---|---|
| | - | | = | |
| | - | | = | |
| | - | | = | |
| | - | | = | |

## STEERING COLUMN

87. Steering Column Type — 2
(1) Fixed column
(2) Tilt column
(3) Telescoping column
(4) Tilt and telescoping column
(8) Other column type (specify):
_____
(9) Unknown

88. Blank — X X
(This variable is left blank so that numbering consistency can be maintained with the 1988-90 CDS.

89. Blank — X X X
(This variable is left blank so that numbering consistency can be maintained with the 1988-90 CDS.

90. Blank — X X X
(This variable is left blank so that numbering consistency can be maintained with the 1988-90 CDS.

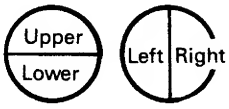
91. Blank — X X X
(This variable is left blank so that numbering consistency can be maintained with the 1988-90 CDS.

92. Steering Rim/Spoke Deformation — 4
3.5" Code actual measured deformation to the nearest inch.
(0) No steering rim deformation
(1-5) Actual measured value
(6) 6 inches or more
(8) Observed deformation cannot be measured
(9) Unknown

93. Location of Steering Rim/Spoke Deformation — 05
(00) No steering rim deformation

Quarter Sections
(01) Section A
(02) Section B
(03) Section C
(04) Section D


Half Sections
(05) Upper half of rim/spoke
(06) Lower half of rim/spoke
(07) Left half of rim/spoke
(08) Right half of rim/spoke




(09) Complete steering wheel collapse
(10) Undetermined location
(99) Unknown

## INSTRUMENT PANEL

94. Odometer Reading — 0 0 1,000
685 miles—Code mileage to the nearest 1,000 miles
(000) No odometer
(001) Less than 1,500 miles
(300) 299,500 miles or more
(999) Unknown
Source: _____

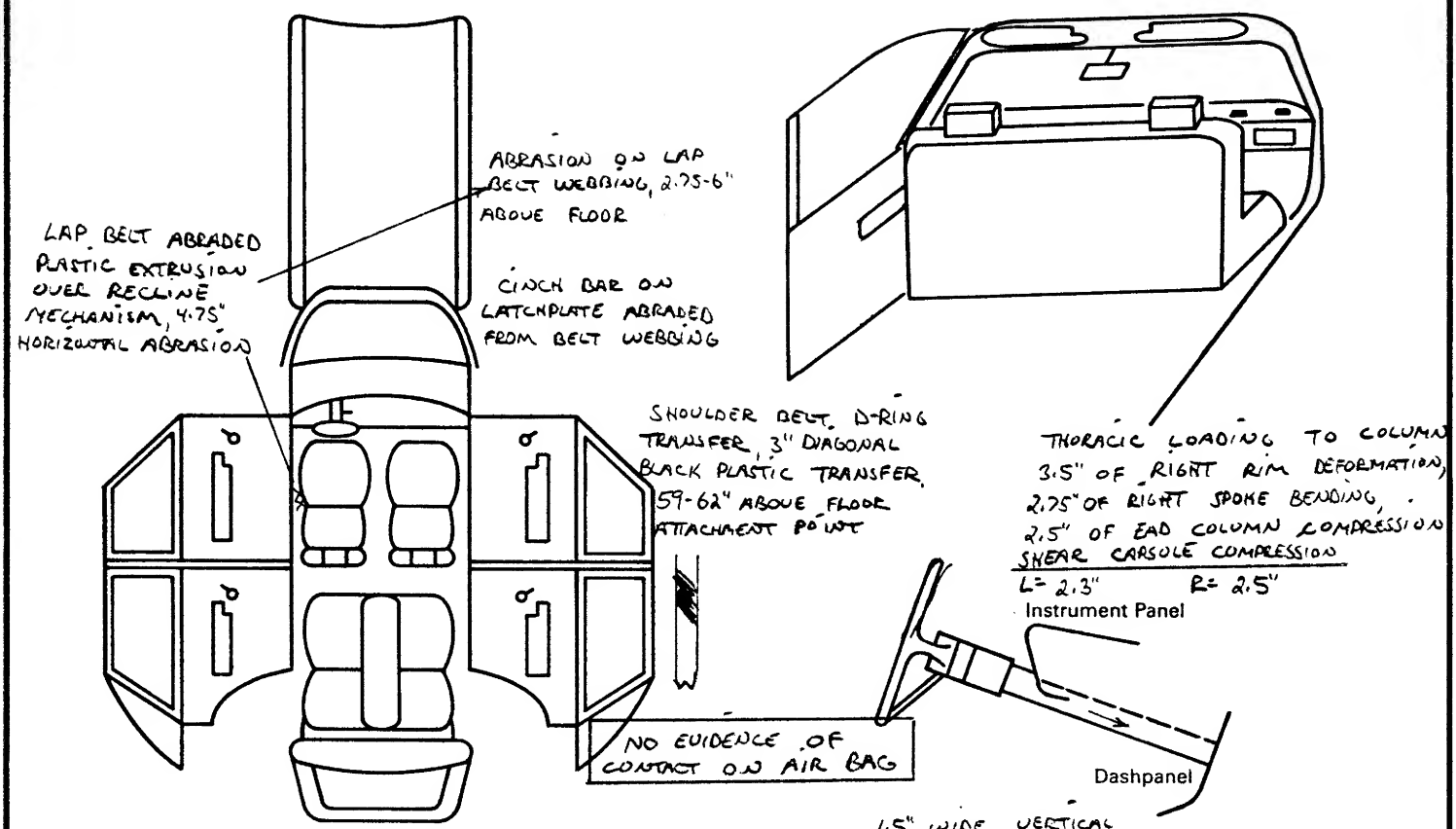
95. Instrument Panel Damage from Occupant Contact? — 1
(0) No
(1) Yes
(9) Unknown

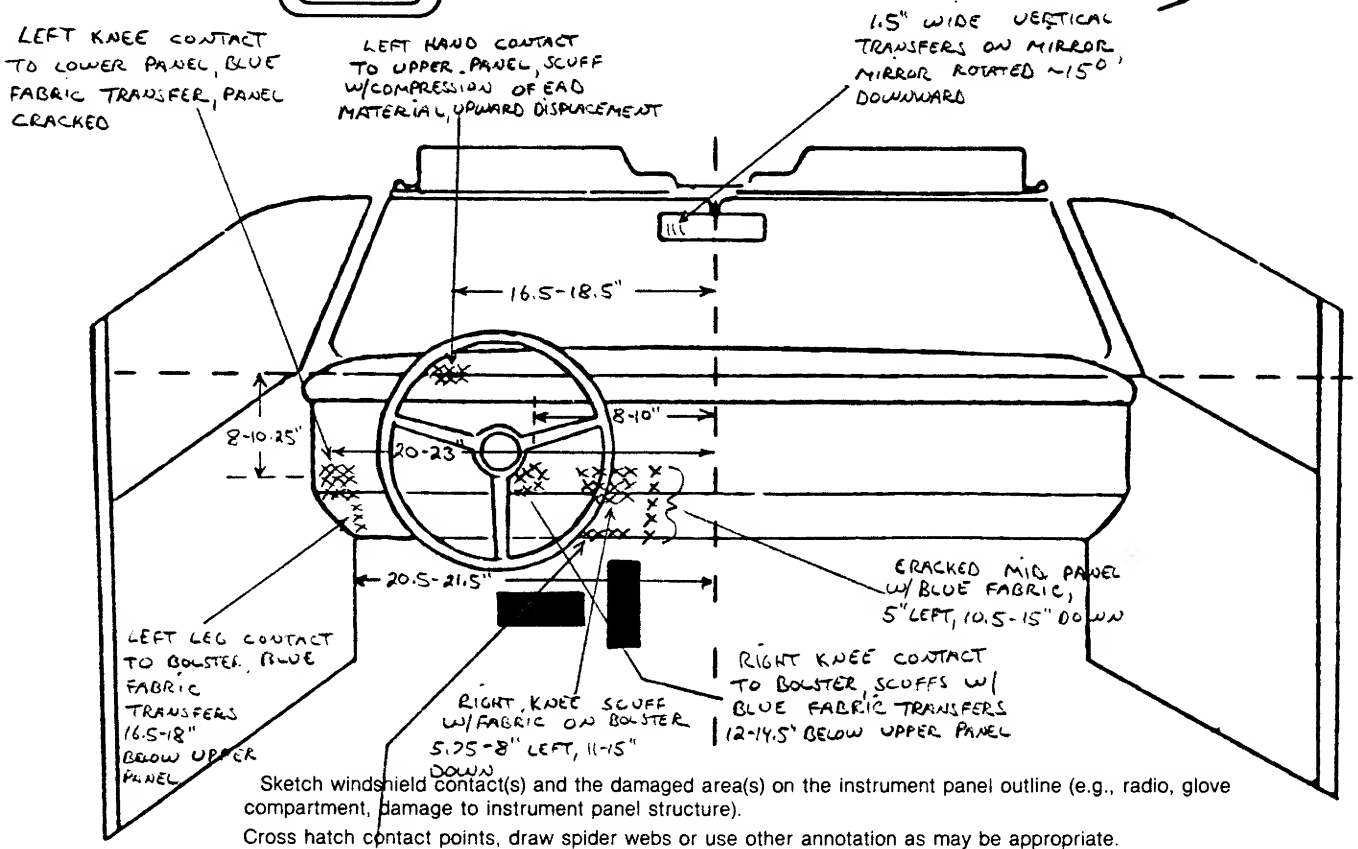
96. Knee Bolsters Deformed from Occupant Contact? — 1
(0) No
(1) Yes
(8) Not present
(9) Unknown

97. Did Glove Compartment Door Open During Collision(s)? — 1
(0) No
(1) Yes
(8) Not present
(9) Unknown

## VEHICLE INTERIOR SKETCHES

Note area of ejection/entrapment




Sketch windshield contact(s) and the damaged area(s) on the instrument panel outline (e.g., radio, glove compartment, damage to instrument panel structure).

Cross hatch contact points, draw spider webs or use other annotation as may be appropriate.

Annotate the contacted area with a letter (begin with A) and list on the Points of Occupant Contact page.

## POINTS OF OCCUPANT CONTACT

| Contact | Interior Component Contacted | Occupant No. If Known | Body Region If Known | Supporting Physical Evidence | Confidence Level of Contact Point |
|---|---|---|---|---|---|
| A | 41 | DRIVER | TORSO | Abrasions to webbing & Plastic upholstery | 1 |
| B | 42 | DRIVER | TORSO | D-Ring transfer on webbing | 1 |
| C | 09 | DRIVER | (L) HAND | SCUFF W/ COMPRESSION | 1 |
| D | 13 | DRIVER | (L) KNEE | FABRIC TRANSFER, PLASTIC CRACKED | 1 |
| E | 13 | DRIVER | (R) KNEE | FABRIC TRANSFER / SCUFF | 1 |
| F | 10 | DRIVER | (R) KNEE | FABRIC TRANSFER / SCUFF | 1 |
| G | 04 | DRIVER | HANDS/TORSO | 3.5" OF RIM DISPLACEMENT | 1 |
| H | 07 | DRIVER | TORSO | 2.5" OF SHEAR CARSOLE SEPARATION | 1 |
| I | 02 | DRIVER | (R) HAND | VERTICAL TRANSFERS, DISPLACEMENT | |
| J | | | | | |
| K | | | | | |
| L | | | | | |
| M | | | | | |
| N | | | | | |

### CODES FOR INTERIOR COMPONENTS

FRONT
- (01) Windshield
- (02) Mirror
- (03) Sunvisor
- (04) Steering wheel rim
- (05) Steering wheel hub/spoke
- (06) Steering wheel (combination of codes 04 and 05)
- (07) Steering column, transmission selector lever, other attachment
- (08) Add on equipment (e.g., CB, tape deck, air conditioner)
- (09) Left instrument panel and below
- (10) Center instrument panel and below
- (11) Right instrument panel and below
- (12) Glove compartment door
- (13) Knee bolster
- (14) Windshield including one or more of the following: front header, A-pillar, instrument panel, mirror,or steering assembly (driver side only)
- (15) Windshield including one or more of the following: front header, A-pillar, instrument panel, or mirror (passenger side only)
- (16) Other front object (specify): _____

LEFT SIDE
- (20) Left side interior surface, excluding hardware or armrests
- (21) Left side hardware or armrest
- (22) Left A pillar
- (23) Left B pillar
- (24) Other left pillar (specify): _____
- (25) Left side window glass or frame
- (26) Left side window glass including one or more of the following: frame, window sill, A-pillar, B-pillar, or roof side rail
- (27) Other left side object (specify): _____

RIGHT SIDE
- (30) Right side interior surface, excluding hardware or armrests
- (31) Right side hardware or armrest
- (32) Right A pillar
- (33) Right B pillar
- (34) Other right pillar (specify): _____
- (35) Right side window glass or frame
- (36) Right side window glass including one or more of the following: frame, window sill, A-pillar, B-pillar, or roof side rail
- (37) Other right side object (specify): _____

INTERIOR
- (40) Seat, back support
- (41) Belt restraint webbing/buckle
- (42) Belt restraint B-pillar attachment point
- (43) Other restraint system component (specify): _____
- (44) Head restraint system
- (45) Air bag
- (46) Other occupants (specify): _____
- (47) Interior loose objects
- (48) Child safety seat (specify): _____
- (49) Other interior object (specify): _____

ROOF
- (50) Front header
- (51) Rear header
- (52) Roof left side rail
- (53) Roof right side rail
- (54) Roof or convertible top

FLOOR
- (56) Floor including toe pan
- (57) Floor or console mounted transmission lever, including console
- (58) Parking brake handle
- (59) Foot controls including parking brake

REAR
- (60) Backlight (rear window)
- (61) Backlight storage rack, door, etc.
- (62) Other rear object (specify): _____

CONFIDENCE LEVEL OF CONTACT POINT
- (1) Certain
- (2) Probable
- (3) Possible
- (4) Unknown

# AUTOMATIC RESTRAINTS

NOTES: Encode the data for each applicable front seat position. The attributes for the variables may be found below. Restraint systems should be assessed during the vehicle inspection then coded on the Occupant Assessment Form.

| | | Left | Center | Right |
|---|---|---|---|---|
| FIRST | Availability | 1 | - | - |
| | Function | 1 | - | - |
| | Failure | 1 | - | - |

## AIR BAGS

**Air Bag System Availability/Function**
(0) Not equipped/not available
(1) Air bag

Non-functional
(2) Air bag disconnected (specify):

_____

(3) Air bag not reinstalled
(9) Unknown

**Air Bag System Deployment**
(0) Not equipped/not available
(1) Air bag deployed during accident
(2) Air bag deployed inadvertently just prior to accident
(3) Air bag deployed, accident sequence undetermined
(4) Nondeployed
(5) Unknown if deployed
(9) Unknown

**Did Air Bag System Fail?**
(0) Not equipped/not available
(1) No
(2) Yes (specify):

_____

(9) Unknown

## AUTOMATIC BELTS

**Automatic (Passive) Belt System Availability/Function**
(0) Not eqipped/not available
(1) 2 point automatic belts
(2) 3 point automatic belts
(3) Automatic belts—type unknown

Non-functional
(4) Automatic belts destroyed or rendered inoperative
(9) Unknown

**Automatic (Passive) Belt System Use**
(0) Not equipped/not available/destroyed or rendered inoperative
(1) Automatic belt in use
(2) Automatic belt not in use (manually disconnected, motorized track inoperative)
(3) Automatic belt use unknown
(9) Unknown

**Automatic (Passive) Belt System Type**
(0) Not equipped/not available
(1) Non-motorized system
(2) Motorized system
(9) Unknown

**Proper Use of Automatic (Passive) Belt System**
(0) Not equipped/not available/not used
(1) Automatic belt used properly
(2) Automatic belt used properly with child safety seat

Automatic Belt Used Improperly
(3) Automatic shoulder belt worn under arm
(4) Automatic shoulder belt worn behind back
(5) Automatic belt worn around more than one person
(6) Lap portion of automatic belt worn on abdomen
(7) Automatic lap and shoulder belt or automatic shoulder belt used improperly with child safety seat (specify):

_____

(8) Other improper use of automatic belt system (specify):_____
(9) Unknown

**Automatic (Passive) Belt Failure Modes During Accident**
(0) Not equipped/not available/not in use
(1) No automatic belt failure(s)
(2) Torn webbing (stretched webbing not included)
(3) Broken buckle or latchplate
(4) Upper anchorage separated
(5) Other anchorage separated (specify):

_____

(6) Broken retractor
(7) Combination of above (specify):
(8) Other automatic belt failure (specify):

_____

(9) Unknown

## MANUAL RESTRAINTS

NOTES: Encode the applicable data **for each seat position** in the vehicle. The attributes for the variables may be found below. Restraint systems should be assessed during the vehicle inspection then coded on the Occupant Assessment Form.

If a child safety seat is present, encode the data on the back of this page.

If the vehicle has automatic restraints available, encode the appropriate data on the back of the previous page.

| | | Left | Center | Right |
|---|---|---|---|---|
| FIRST | Availability | 4 | 3 | 4 |
| | Use | 04 | - | - |
| | Failure Modes | 1 | - | - |
| SECOND | Availability | 4 | 3 | 4 |
| | Use | - | - | - |
| | Failure Modes | - | - | - |
| THIRD | Availability | | | |
| | Use | | | |
| | Failure Modes | | | |
| OTHER | Availability | | | |
| | Use | | | |
| | Failure Modes | | | |

**Manual (Active) Belt System Availability**

(0) Not available
(1) Belt removed/destroyed
(2) Shoulder belt
(3) Lap belt
(4) Lap and shoulder belt
(5) Belt available – type unknown
(8) Other belt (specify):

_____

(9) Unknown

**Manual (Active) Belt System Use**

(00) None used, not available, or belt removed/destroyed
(01) Inoperative (specify):

_____

(02) Shoulder belt
(03) Lap belt
(04) Lap and shoulder belt
(05) Belt used – type unknown

_____

(08) Other belt used (specify):

_____

(12) Shoulder belt used with child safety seat
(13) Lap belt used with child safety seat
(14) Lap and shoulder belt used with child safety seat
(15) Belt used with child safety seat – type unknown
(18) Other belt used with child safety seat (specify):

_____

(99) Unknown if belt used

**Manual (Active) Belt Failure Modes During Accident**

(0) No manual belt used or not available
(1) No manual belt failure(s)
(2) Torn webbing (stretched webbing not included)
(3) Broken buckle or latchplate
(4) Upper anchorage separated
(5) Other anchorage separated (specify):

_____

(6) Broken retractor
(7) Combination of above (specify):

_____

(8) Other manual belt failure (specify):

_____

(9) Unknown

## CHILD SAFETY SEAT FIELD ASSESSMENT

When a child safety seat is present enter the occupant's number in the first row and complete the column below the occupant's number using the codes listed below. Complete a column for each child safety seat present.

| Occupant Number | | | | | | |
|---|---|---|---|---|---|---|
| 1. Type of Child Safety Seat | | | | | | |
| 2. Child Safety Seat Orientation | | | | | | |
| 3. Child Safety Seat Harness Usage | | | | | | |
| 4. Child Safety Seat Shield Usage | | | | | | |
| 5. Child Safety Seat Tether Usage | | | | | | |
| 6. Child Safety Seat Make/Model | Specify Below for Each Child Safety Seat | | | | | |

1. Type of Child Safety Seat

(0) No child safety seat
(1) Infant seat
(2) Toddler seat
(3) Convertible seat
(4) Booster seat
(7) Other type child safety seat (specify):

_____

(8) Unknown child safety seat type
(9) Unknown if child safety seat used

2. Child Safety Seat Orientation

(00) No child safety seat

Designed for Rear Facing for This Age/Weight
(01) Rear facing
(02) Forward facing
(03) Other orientation (specify):

_____

(04) Unknown orientation

Designed for Forward Facing for This Age/Weight
(11) Rear facing
(12) Forward facing
(18) Other orientation (specify):

_____

(19) Unknown orientation

Unknown Design or Orientation for This Age/Weight, or Unknown Age/Weight
(21) Rear facing
(22) Forward facing
(28) Other orientation (specify):

_____

(29) Unknown orientation

(99) Unknown if child safety seat used

3. Child Safety Seat Harness Usage

4. Child Safety Seat Shield Usage

5. Child Safety Seat Tether Usage

Note: Options Below Are Used for Variables 3-5.

(00) No child safety seat

Not Designed with Harness/Shield/Tether
(01) After market harness/shield/tether added, not used
(02) After market harness/shield/tether used
(03) Child safety seat used, but no after market harness/shield/tether added
(09) Unknown if harness/shield/tether added or used

Designed with Harness/Shield/Tether
(11) Harness/shield/tether not used
(12) Harness/shield/tether used
(19) Unknown if harness/shield/tether used

Unknown if Designed with Harness/Shield/Tether
(21) Harness/shield/tether not used
(22) Harness/shield/tether used
(29) Unknown if harness/shield/tether used

(99) Unknown if child safety seat used

6. Child Safety Seat Make/Model
(Specify make/model and occupant number)

_____

_____

_____

_____

## HEAD RESTRAINTS/SEAT EVALUATION

NOTES: Encode the applicable data for **each seat position** in the vehicle. The attributes for these variables may be found at the bottom of the page. Head restraint type/damage and seat type/performance should be assessed during the vehicle inspection then coded on the Occupant Assessment Form.

| | | Left | Center | Right |
|---|---|---|---|---|
| FIRST | Head Restraint Type/Damage | 3 | – | 3 |
| | Seat Type | 06 | 06 | 06 |
| | Seat Performance | 8 | 8 | 8 |
| SECOND | Head Restraint Type/Damage | 0 | 0 | 0 |
| | Seat Type | 03 | 03 | 03 |
| | Seat Performance | 1 | 1 | 1 |
| THIRD | Head Restraint Type/Damage | | | |
| | Seat Type | | | |
| | Seat Performance | | | |
| OTHER | Head Restraint Type/Damage | | | |
| | Seat Type | | | |
| | Seat Performance | | | |

**Head Restraint Type/Damage by Occupant at This Occupant Position**

(0) No head restraints
(1) Integral – no damage
(2) Integral – damaged during accident
(3) Adjustable – no damage
(4) Adjustable – damaged during accident
(5) Add-on – no damage
(6) Add-on – damaged during accident
(8) Other (specify): _____
(9) Unknown

**Seat Type (This Occupant Position)**

(00) No seat
(01) Bucket
(02) Bucket with folding back
(03) Bench
(04) Bench with separate back cushions
(05) Bench with folding back(s)
(06) Split bench with separate back cushions
(07) Split bench with folding back(s)
(08) Pedestal (i.e., van type)
(09) Other seat type (specify): _____
(99) Unknown

**Seat Performance (This Occupant Position)**

(0) No seat
(1) No seat performance failure(s)
(2) Seat adjusters failed
(3) Seat back folding locks failed
(4) Seat tracks/anchors failed
(5) Deformed by impact of occupant
(6) Deformed by passenger compartment intrusion (specify):
_____
_____
(7) Combination of above (specify):
(8) Other (specify):
seat assembly displaced by deformation + intrusion of floor
(9) Unknown

**DESCRIBE ANY INDICATION OF ABNORMAL OCCUPANT POSTURE (I.E. UNUSUAL OCCUPANT CONTACT PATTERN)**

## EJECTION/ENTRAPMENT DATA

Complete the following if the researcher has any indications that an occupant was either ejected from or entrapped in the vehicle. Code the appropriate data on the Occupant Assessment Form.

EJECTION No [✓] Yes [ ]

Describe indications of ejection and body parts involved in partial ejection(s):

| | | | | | | |
|---|---|---|---|---|---|---|
| Occupant Number | | | | | | |
| Ejection | | | | | | |
| (Note on Vehicle Interior Sketch) Ejection Area | | | | | | |
| Ejection Medium | | | | | | |
| Medium Status | | | | | | |

**Ejection**
(1) Complete ejection
(2) Partial ejection
(3) Ejection, unknown degree
(9) Unknown

**Ejection Area**
(1) Windshield
(2) Left front
(3) Right front
(4) Left rear
(5) Right rear
(6) Rear
(7) Roof
(8) Other area (e.g., back of pickup, etc.) (specify):
(9) Unknown

**Ejection Medium**
(1) Door/hatch/tailgate
(2) Nonfixed roof structure
(3) Fixed glazing
(4) Nonfixed glazing (specify):
(5) Integral structure
(8) Other medium (specify):
(9) Unknown

**Medium Status (Immediately Prior to Impact)**
(1) Open
(2) Closed
(3) Integral structure
(9) Unknown

ENTRAPMENT No [✓] Yes [ ]

Describe entrapment mechanism:

Component(s):

(Note in vehicle interior diagram)

# APPENDIX E

NASS Occupant Forms

U.S. Department of Transportation
National Highway Traffic Safety Administration

# OCCUPANT ASSESSMENT FORM

Form Approved
O.M.B. No. 2127-0021
NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. ~~Primary Sampling Unit Number~~ ____
2. Case Number – ~~Stratum~~ 91-14
3. Vehicle Number 01
4. Occupant Number 01

## OCCUPANT'S CHARACTERISTICS

5. Occupant's Age 49
   Code actual age at time of accident.
   (00) Less than one year old (specify by month): _____
   (97) 97 years and older
   (99) Unknown

6. Occupant's Sex 1
   (1) Male
   (2) Female
   (9) Unknown

7. Occupant's Height 75"
   Code actual height to the nearest inch.
   (99) Unknown

8. Occupant's Weight 185
   Code actual weight to the nearest pound.
   (999) Unknown

9. Occupant's Role 1
   (1) Driver
   (2) Passenger
   (9) Unknown

10. Occupant's Seat Position 11

Front Seat
(11) Left side
(12) Middle
(13) Right Side
(14) Other (specify): _____
(15) On or in the lap of another occupant

Second Seat
(21) Left side
(22) Middle
(23) Right Side
(24) Other (specify): _____
(25) On or in the lap of another occupant

Third Seat
(31) Left side
(32) Middle
(33) Right Side
(34) Other (specify): _____
(35) On or in the lap of another occupant

Fourth Seat
(41) Left side
(42) Middle
(43) Right Side
(44) Other (specify): _____
(45) On or in the lap of another occupant

(97) In or on unenclosed area
(98) Other seat (specify): _____
(99) Unknown

11. Occupant's Posture 0
    (0) Normal posture
    (1) Abnormal posture (specify): _____
    (9) Unknown

## EJECTION/ENTRAPMENT

12. Ejection 0
    (0) No ejection
    (1) Complete ejection
    (2) Partial ejection
    (3) Ejection, unknown degree
    (9) Unknown

13. Ejection Area 0
    (0) No ejection
    (1) Windshield
    (2) Left front
    (3) Right front
    (4) Left rear
    (5) Right rear
    (6) Rear
    (7) Roof
    (8) Other area (e.g., back of pickup, etc.)
    (specify): _____
    (9) Unknown

14. Ejection Medium 0
    (0) No ejection
    (1) Door/hatch/tailgate
    (2) Nonfixed roof structure
    (3) Fixed glazing
    (4) Nonfixed glazing (specify): _____
    (5) Integral structure
    (8) Other medium (specify): _____
    (9) Unknown

15. Medium Status (Immediately Prior to Impact) 0
    (0) No ejection
    (1) Open
    (2) Closed
    (3) Integral structure
    (9) Unknown

16. Entrapment 0
    (NOTE: Entrapped means that part of the person was in the vehicle and mechanically restrained; jammed doors and immobilizing injuries by themselves are not sufficient to constitute entrapment.)
    (0) Not entrapped
    (1) Entrapped
    (9) Unknown

HS Form 433A (Rev. 1/91)

This report is authorized by P.L. 89-563, Title 1, Section 106, 108, and 112. While you are not required to respond, your cooperation is needed to make the results of this data collection effort comprehensive accurate, and timely.

## RESTRAINT SYSTEM AND SEAT EVALUATION

17. Manual (Active) Belt System Availability 4
(0) Not available
(1) Belt removed/destroyed
(2) Shoulder belt
(3) Lap belt
(4) Lap and shoulder belt
(5) Belt available—type unknown
(8) Other belt (specify):
(9) Unknown

18. Manual (Active) Belt System Use 04
(00) None used, not available, or belt removed/destroyed
(01) Inoperative (specify):
(02) Shoulder belt
(03) Lap belt
(04) Lap and shoulder belt
(05) Belt used—type unknown
(08) Other belt used (specify):
(12) Shoulder belt used with child safety seat
(13) Lap belt used with child safety seat
(14) Lap and shoulder belt used with child safety seat
(15) Belt used with child safety seat—type unknown
(18) Other belt used with child safety seat (specify):
(99) Unknown if belt used

19. Proper Use of Manual (Active) Belts 1
(0) None used or not available
(1) Belt used properly
(2) Belt used properly with child safety seat

Belt Used Improperly
(3) Shoulder belt worn under arm
(4) Shoulder belt worn behind back or seat
(5) Belt worn around more than one person
(6) Lap belt worn on abdomen
(7) Lap belt or lap and shoulder belt used improperly with child safety seat (specify):
(8) Other improper use of manual belt system (specify):
(9) Unknown

20. Manual (Active) Belt Failure Modes During Accident 1
(0) No manual belt used or not available
(1) No manual belt failure(s)
(2) Torn webbing (stretched webbing not included)
(3) Broken buckle or latchplate
(4) Upper anchorage separated
(5) Other anchorage separated (specify):
(6) Broken retractor
(7) Combination of above (specify):
(8) Other manual belt failure (specify):
(9) Unknown

21. Air Bag System Availability/Function 1
(0) Not equipped/not available
(1) Air bag

Non-functional
(2) Air bag disconnected (specify):
(3) Air bag not reinstalled
(9) Unknown

22. Air Bag System Deployment 1
(0) Not equipped/not available
(1) Air bag deployed during accident
(2) Air bag deployed inadvertently just prior to accident
(3) Air bag deployed, accident sequence undetermined
(4) Nondeployed
(5) Unknown if deployed
(9) Unknown

23. Did Air Bag System Fail? 1
(0) Not equipped/not available
(1) No
(2) Yes (specify):
(9) Unknown

Note: See Variables 44 through 48 (Page 5) for Information on Automatic Belts

24. Police Reported Restraint Use 4
(0) None used
(1) Police did not indicate restraint use
(2) Shoulder belt
(3) Lap belt
(4) Lap and shoulder belt
(5) Belt used, type not specified
(6) Child safety seat
(7) Other or automatic restraint (specify):
(8) Restrained, type unknown
(9) Police indicated "unknown"

25. Head Restraint Type/Damage by Occupant at This Occupant Position 3
(0) No head restraints
(1) Integral—no damage
(2) Integral—damaged during accident
(3) Adjustable—no damage
(4) Adjustable—damaged during accident
(5) Add-on—no damage
(6) Add-on—damaged during accident
(8) Other specify):
(9) Unknown

26. Seat Type (This Occupant Position) 06
(00) Occupant not seated or no seat
(01) Bucket
(02) Bucket with folding back
(03) Bench
(04) Bench with separate back cushions
(05) Bench with folding back(s)
(06) Split bench with separate back cushions
(07) Split bench with folding back(s)
(08) Pedestal (i.e., van type)
(09) Other seat type (specify):

(99) Unknown

27. Seat Performance (This Occupant Position) 6
(0) Occupant not seated or no seat
(1) No seat performance failure(s)
(2) Seat adjusters failed
(3) Seat back folding locks failed
(4) Seat track/anchors failed
(5) Deformed by impact of occupant
(6) Deformed by passenger compartment intrusion (specify):
4" VERTICAL DISPLACEMENT OF FLOOR PAN
(7) Combination of above (specify):
(8) Other (specify):
(9) Unknown

## CHILD SAFETY SEAT

28. Child Safety Seat Make/Model 000
(000) No child safety seat
Applicable codes are found in your NASS CDS Data Collection, Coding, and Editing Manual
(997) Other make/model (specify):
(998) Unknown make/model
(999) Unknown if child safety seat used

29. Type of Child Safety Seat 0
(0) No child safety seat
(1) Infant seat
(2) Toddler seat
(3) Convertible seat
(4) Booster seat
(7) Other type child safety seat (specify):
(8) Unknown child safety seat type
(9) Unknown if child safety seat used

30. Child Safety Seat Orientation 00
(00) No child safety seat

Designed for Rear Facing for This Age/Weight
(01) Rear facing
(02) Forward facing
(08) Other orientation (specify):
(09) Unknown orientation

Designed for Forward Facing for This Age/Weight
(11) Rear facing
(12) Forward facing
(18) Other orientation (specify):
(19) Unknown orientation

Unknown Design or Orientation for This Age/Weight, or Unknown Age/Weight
(21) Rear facing
(22) Forward facing
(28) Other orientation (specify):
(29) Unknown orientation

(99) Unknown if child safety seat used

31. Child Safety Seat Harness Usage 00
32. Child Safety Seat Shield Usage 00
33. Child Safety Seat Tether Usage 00
Note: Options below applicable to Variables OA31-OA33.
(00) No child safety seat

Not Designed with Harness/Shield/Tether
(01) After market harness/shield/tether added, not used
(02) After market harness/shield/tether used
(03) Child safety seat used, but no after market harness/shield/tether added
(09) Unknown if harness/shield/tether added or used

Designed with Harness/Shield/Tether
(11) Harness/shield/tether not used
(12) Harness/shield/tether used
(19) Unknown if harness/shield/tether used

Unknown If Designed with Harness/Shield/Tether
(21) Harness/shield/tether not used
(22) Harness/shield/tether used
(29) Unknown if harness/shield/tether used

(99) Unknown if child safety seat used

## INJURY CONSEQUENCES

34. Injury Severity (Police Rating) 1
(0) O—No injury
(1) C—Possible injury
(2) B—Nonincapacitating injury
(3) A—Incapacitating injury
(4) K—Killed
(5) U—Injury, severity unknown
(6) Died prior to accident
(9) Unknown

35. Treatment—Mortality 3
(0) No treatment
(1) Fatal
(2) Fatal—ruled disease

Nonfatal
(3) Hospitalized
(4) Transported and released
(5) Treatment at scene—nontransported
(6) Treatment later
(8) Treatment—other (specify):

_____

(9) Unknown

36. Type of Medical Facility (for Initial Treatment) 2
(0) Not treated at a medical facility
(1) Trauma center
(2) Hospital
(3) Medical clinic
(4) Physician's office
(5) Treatment later at medical facility
(8) Other (specify):

_____

(9) Unknown

37. Hospital stay 04
____ Code number of days (up through 60) that the occupant stayed in the hospital
(00) Not hospitalized
(61) 61 days or more
(99) Unknown

38. Working Days Lost 15
____ Code the number of days (up through 60) that the occupant lost from work due to the accident
(00) No working days lost
(61) 61 days or more ~3 wks.
(62) Fatally injured
(97) Not working prior to accident
(99) Unknown

39. Time to Death 00
____ Code number of hours from time of accident to time of death up through 24 hours. If time of death is greater than 24 hours, code number of days. (Note: 1 day = 31, 2 days = 32, ... n days = 30 + n up through 30 days = 60)
(00) Not fatal
(96) Fatal—ruled disease
(99) Unknown

40. 1st Medically Reported Cause of Death 00

41. 2nd Medically Reported Cause of Death 00

42. 3rd Medically Reported Cause of Death 00
____ Code the Occupant Injury from line number(s) for the medically reported injury(s) which reportedly contributed to this occupant's death
(00) Not fatal or no additional causes
(97) Other result (specify):

_____

(99) Unknown

43. Number of Recorded Injuries for This Occupant 08
____ Code the actual number of injuries recorded for this occupant.
(00) No recorded injuries
(97) Injured, details unknown
(99) Unknown if injured

44. Automatic (Passive) Belt System Availability/ Function — 0

(0) Not equipped/not available
(1) 2 point automatic belts
(2) 3 point automatic belts
(3) Automatic belts-type unknown

Non-functional
(4) Automatic belts destroyed or rendered inoperative
(9) Unknown

45. Automatic (Passive) Belt System Use — 0

(0) Not equipped/not available/destroyed or rendered inoperative
(1) Automatic belt in use
(2) Automatic belt not in use (manually disconnected, motorized track inoperative) (specify):

_____

(3) Automatic belt use unknown
(9) Unknown

46. Automatic (Passive) Belt System Type — 0

(0) Not equipped/not available
(1) Non-motorized system
(2) Motorized system
(9) Unknown

47. Proper Use of Automatic (Passive) Belt System — 0

(0) Not equipped/not available/not used
(1) Automatic belt used properly
(2) Automatic belt used properly with child safety seat

Automatic Belt Used Improperly
(3) Automatic shoulder belt worn under arm
(4) Automatic shoulder belt worn behind back
(5) Automatic belt worn around more than one person
(6) Lap portion of automatic belt worn on abdomen
(7) Automatic lap and shoulder belt or automatic shoulder belt used improperly with child safety seat (specify):

_____

(8) Other improper use of automatic belt system (specify): _____
(9) Unknown

48. Automatic (Passive) Belt Failure Modes During Accident — 0

(0) Not equipped/not available/not in use
(1) No automatic belt failure(s)
(2) Torn webbing (stretched webbing not included)
(3) Broken buckle or latchplate
(4) Upper anchorage separated
(5) Other anchorage separated (specify):

_____

(6) Broken retractor
(7) Combination of above (specify):
(8) Other automatic belt failure (specify):

_____

(9) Unknown

UPDATE CANDIDATE? NO [✓] YES [ ]

OCCUPANT INJURY FORM INCLUDED WITH INITIAL SUBMISSION? NO [ ] YES [✓]

*** STOP HERE ***
IF THERE ARE NO RECORDED INJURIES
(I.E., OA43 = 00,97,99)

(Rev. 1/91)

U.S. Department of Transportation
**National Highway Traffic Safety Administration**

# OCCUPANT INJURY FORM

Form Approved
O.M.B. No. 2127-0021
NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. ~~Primary Sampling Unit Number~~ ____ 3. Vehicle Number 01
2. Case Number ~~Stratum~~ 91-14 4. Occupant Number 01

## INJURY DATA

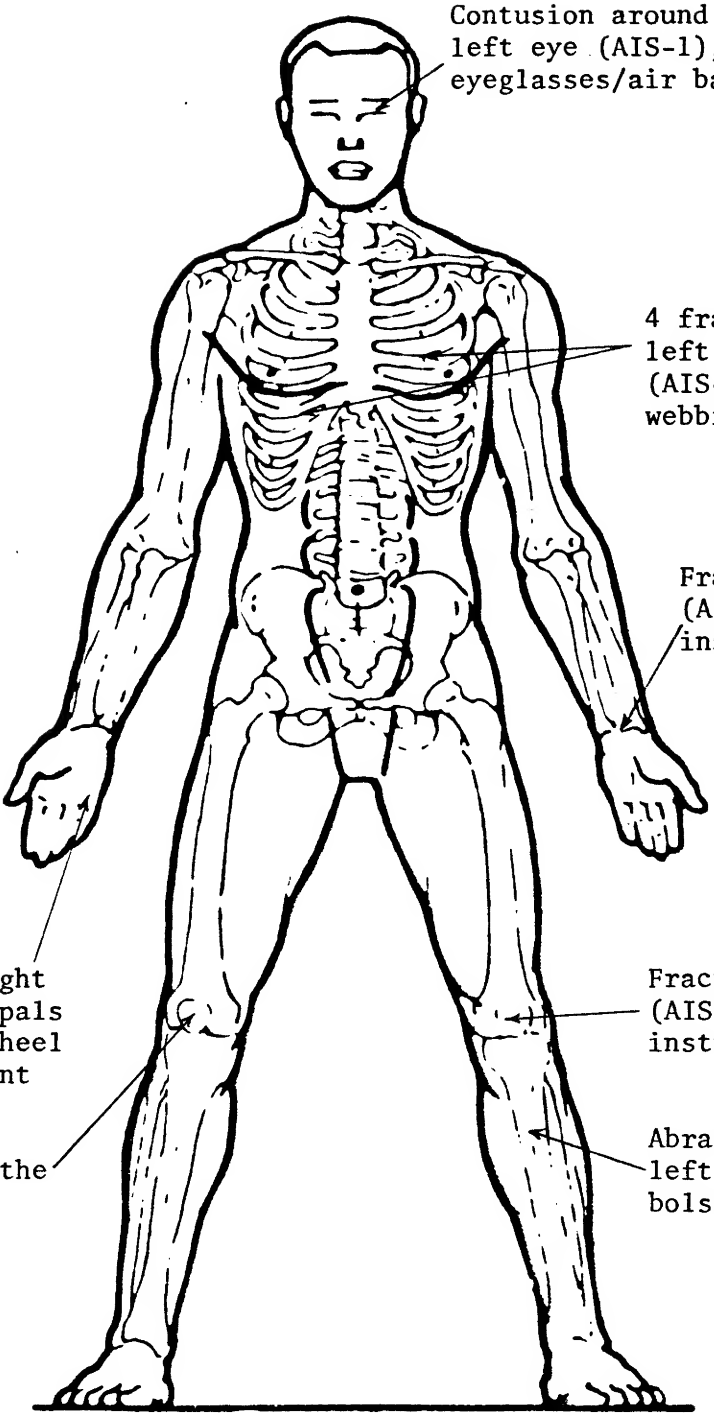
Record below the actual injuries sustained by this occupant that were identified from the official and unofficial data sources. Remember not to double count an injury just because it was identified from two different sources. If greater than ten injuries have been documented, encode the balance on the Occupant Injury Supplement.

| | Source of Injury Data | O.I.C.—A.I.S. Body Region | Aspect | Lesion | System Organ | A.I.S. Severity | Injury Source | Injury Source Confidence Level | Direct/ Indirect Injury | Occupant Area Intrusion No. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1st | 5. 7 | 6. C | 7. B | 8. F | 9. S | 10. 3 | 11. 41/05 | 12. 1 | 13. 1 | 14. 00 |
| 2nd | 15. 7 | 16. K | 17. L | 18. F | 19. S | 20. 2 | 21. 09 | 22. 1 | 23. 1 | 24. 02 |
| 3rd | 25. 7 | 26. K | 27. R | 28. R | 29. M | 30. 2 | 31. 13 | 32. 1 | 33. 1 | 34. 02 |
| 4th | 35. 7 | 36. W | 37. R | 28. F | 39. S | 40. 2 | 41. 04/10 | 42. 2 | 43. 2 | 44. 02 |
| 5th | 45. 7 | 46. W | 47. R | 48. F | 49. S | 50. 2 | 51. 04/10 | 52. 1 | 53. 2 | 54. 02 |
| 6th | 55. 7 | 56. W | 57. L | 58. F | 59. S | 60. 2 | 61. 09 | 62. 1 | 63. 2 | 64. 02 |
| 7th | 65. 7 | 66. F | 67. L | 68. C | 69. O | 70. 1 | 71. 45 | 72. 1 | 73. 2 | 74. 00 |
| 8th | 75. 7 | 76. L | 77. L | 78. A | 79. I | 80. 1 | 81. 13 | 82. 1 | 83. 1 | 84. 02 |
| 9th | 85. __ | 86. __ | 87. __ | 88. __ | 89. __ | 90. __ | 91. __ | 92. __ | 93. __ | 94. __ |
| 10th | 95. __ | 96. __ | 97. __ | 98. __ | 99. __ | 100. __ | 101. __ | 102. __ | 103. __ | 104. __ |

HS Form 433B (1/91)

This report is authorized by P.L. 89-563, Title 1, Section 106, 108, and 112. While you are not required to respond, your cooperation is needed to make the results of this data collection effort comprehensive, accurate, and timely.

**AGE** 49
**SEX** Male
**WT.** 185 lbs.
**HT.** 75"



Contusion around left eye (AIS-1), eyeglasses/air bag

4 fractured ribs, 3 on left side, 1 on right (AIS-3), shoulder belt webbing/steering assembly

Fractured left wrist (AIS-2), upper instrument panel

Fractures of the right 4th and 5th metacarpals (AIS-2), steering wheel rim, upper instrument panel

Ruptured tendon of the right knee (AIS-2), knee bolster

Fractured left patella (AIS-2), mid left instrument panel

Abrasions of the anterior left leg (AIS-1), knee bolster

## SOURCE OF INJURY DATA

OFFICIAL

(1) Autopsy records with or without hospital medical records
(2) Hospital medical records other than emergency room (eg. discharge summary)
(3) Emergency room records only (including associated X-rays or other lab reports)
(4) Private physician, walk-in or emergency clinic

UNOFFICIAL

(5) Lay coroner report
(6) E.M.S. personnel
(7) Interviewee
(8) Other source (specify):

(9) Police

## INJURY SOURCE

FRONT

(01) Windshield
(02) Mirror
(03) Sunvisor
(04) Steering wheel rim
(05) Steering wheel hub/spoke
(06) Steering wheel (combination of codes 04 and 05)
(07) Steering column, transmission selector lever, other attachment
(08) Add-on equipment (e.g., CB, tape deck, air conditioner)
(09) Left instrument panel and below
(10) Center instrument panel and below
(11) Right instrument panel and below
(12) Glove compartment door
(13) Knee bolster
(14) Windshield including one or more of the following: front header, A-pillar, instrument panel, mirror, or steering assembly (driver side only)
(15) Windshield including one or more of the following: front header, A-pillar, instrument panel, or mirror (passenger side only)
(16) Other front object (specify):

LEFT SIDE

(20) Left side interior surface, excluding hardware or armrests
(21) Left side hardware or armrest
(22) Left A pillar
(23) Left B pillar
(24) Other left pillar (specify):

(25) Left side window glass or frame
(26) Left side window glass including one or more of the following: frame, window sill, A-pillar, B-pillar, or roof side rail
(27) Other left side object (specify):

RIGHT SIDE

(30) Right side interior surface, excluding hardware or armrests
(31) Right side hardware or armrest
(32) Right A pillar
(33) Right B pillar
(34) Other right pillar (specify):

(35) Right side window glass or frame
(36) Right side window glass including one or more of the following: frame, window sill, A-pillar, B-pillar, roof side rail
(37) Other right side object (specify):

INTERIOR

(40) Seat, back support
(41) Belt restraint webbing/buckle
(42) Belt restraint B-pillar attachment point
(43) Other restraint system component (specify):

(44) Head restraint system
(45) Air bag
(46) Other occupants (specify):

(47) Interior loose objects
(48) Child safety seat (specify):

(49) Other interior object (specify):

ROOF

(50) Front header
(51) Rear header
(52) Roof left side rail
(53) Roof right side rail
(54) Roof or convertible top

FLOOR

(56) Floor including toe pan
(57) Floor or console mounted transmission lever, including console
(58) Parking brake handle
(59) Foot controls including parking brake

REAR

(60) Backlight (rear window)
(61) Backlight storage rack, door, etc.
(62) Other rear object (specify):

EXTERIOR OF OCCUPANT'S VEHICLE

(65) Hood
(66) Outside hardware (e.g., outside mirror, antenna)
(67) Other exterior surface or tires (specify):

(68) Unknown exterior objects

EXTERIOR OF OTHER MOTOR VEHICLE

(70) Front bumper
(71) Hood edge
(72) Other front of vehicle (specify):

(73) Hood
(74) Hood ornament
(75) Windshield, roof rail, A-pillar
(76) Side surface
(77) Side mirrors
(78) Other side protrusions (specify):

(79) Rear surface
(80) Undercarriage
(81) Tires and wheels
(82) Other exterior of other motor vehicle (specify):

(83) Unknown exterior of other motor vehicle

OTHER VEHICLE OR OBJECT IN THE ENVIRONMENT

(84) Ground
(85) Other vehicle or object (specify)

(86) Unknown vehicle or object

NONCONTACT INJURY

(90) Fire in vehicle
(91) Flying glass
(92) Other noncontact injury source (specify)

(97) Injured, unknown source

## INJURY SOURCE CONFIDENCE LEVEL

(1) Certain
(2) Probable
(3) Possible
(9) Unknown

## DIRECT/INDIRECT INJURY

(1) Direct contact injury
(2) Indirect contact injury
(3) Noncontact injury
(7) Injured, unknown source

## OCCUPANT INJURY CLASSIFICATION

### O.I.C. Body Region

(M) Abdomen
(Q) Ankle–foot
(A) Arm (upper)
(B) Back–thoracolumbar spine
(C) Chest
(E) Elbow
(F) Face
(R) Forearm
(H) Head–skull
(U) Injured, unknown region
(K) Knee
(L) Leg (lower)
(Y) Lower limb(s) (whole or unknown part)
(N) Neck–cervical spine
(P) Pelvic–hip
(S) Shoulder
(T) Thigh
(X) Upper limb(s) (whole or unknown part)
(O) Whole body
(W) Wrist–hand

### Aspect of Injury

(A) Anterior–front
(B) Bilateral (rib fracture only).
(C) Central
(I) Inferior–lower
(U) Injured, unknown aspect
(L) Left
(P) Posterior–back
(R) Right
(S) Superior–upper
(W) Whole region

### Lesion

(A) Abrasion
(M) Amputation
(V) Avulsion
(B) Burn
(K) Concussion
(C) Contusion
(N) Crush
(G) Detachment, separation
(D) Dislocation
(F) Fracture
(Z) Fracture and dislocation
(U) Injured, unknown lesion
(L) Laceration
(O) Other
(P) Perforation, puncture
(R) Rupture
(S) Sprain
(T) Strain
(E) Total severance, transection

### System/Organ

(W) All systems in region
(A) Arteries–veins
(B) Brain
(D) Digestive
(E) Ears
(O) Eye
(H) Heart
(U) Injured, unknown system
(I) Integumentary
(J) Joints
(K) Kidneys
(L) Liver
(M) Muscles
(N) Nervous system
(P) Pulmonary–lungs
(R) Respiratory
(S) Skeletal
(C) Spinal cord
(Q) Spleen
(T) Thyroid, other endocrine gland
(G) Urogenital
(V) Vertebrae

### Abbreviated Injury Scale

(1) Minor injury
(2) Moderate injury
(3) Serious injury
(4) Severe injury
(5) Critical injury
(6) Maximum (untreatable)
(7) Injured, unknown severity